FUTURE NUCLEAR WEAPONS REQUIREMENTS

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FUTURE NUCLEAR WEAPONS REQUIREMENTS

HEARING

BEFORE THE

DEFENSE POLICY PANEL

AND THE

DEPARTMENT OF ENERGY DEFENSE NUCLEAR FACILITIES PANEL

OF THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES

ONE HUNDRED SECOND CONGRESS

SECOND SESSION

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FUTURE NUCLEAR WEAPONS REQUIREMENTS

House of Representatives, Committee on Armed Services, Defense Policy Panel and the Department of Energy Defense Nuclear Facilities Panel, *Washington, DC, Wednesday, April 8, 1992*

The panels met, pursuant to notice, at 2 p.m., in room 2118, Rayburn House Office Building, Hon. John M. Spratt, Jr., (chairman of the panel) presiding.

OPENING STATEMENT OF HON. JOHN M. SPRATT, JR., A REPRESENTATIVE FROM SOUTH CAROLINA, CHAIRMAN, DEPARTMENT OF ENERGY DEFENSE NUCLEAR FACILITIES PANEL

Mr. Spratt. Chairman Aspin asked me to call the hearing to order and welcome our two witnesses: Former Secretary of the Air Force Thomas Reed and former Director of the Lawrence Livermore National Laboratory Michael May. We welcome both of you.

The focus of our hearing today is on future nuclear weapons requirements. Mr. May is the author, under the auspices of the National Academy of Sciences, of a pamphlet entitled "The Future of the U.S.-Soviet Nuclear Relationship." The article illustrates the problem that we are addressing today, in that the title is already out of date. The world is moving faster than the policy-makers can keep pace with.

That is one of the questions that we have before us. What do the changes in today's world imply, in particular, for the nuclear arsenal that we maintain?

Mr. May suggests that as few as a thousand nuclear weapons may be adequate for our security, our deterrent, and ability to maintain stability in the world. Secretary Reed has suggested that we have more than 1,000 targets. In his study with Michael Wheeler, "The Role of Nuclear Weapons in the New World Order," a need for substantially more than that. I think 5,000 to 6,000 nuclear weapons is indicated.

So we have different viewpoints presented here today. We want to explore with the witnesses the rewards of this new world order, and the risks that come along with it, the problems of proliferation, of counting, and of breakout that accompany a world in which there are fewer nuclear weapons, and possibly also the possibilities for systems such as ballistic missile defense or SDI in a world where defenses may make more sense than they did with 20,000 to 25,000 nuclear arms on each side.

So we welcome both of you to the hearing today, and we look forward to your testimony. But before giving you the floor, let me ask

Mr. Kyl, who I believe is the substitute ranking member, if he has any comments that he would like to make.

STATEMENT OF HON. JON KYL, A REPRESENTATIVE FROM ARIZONA, RANKING MINORITY MEMBER, DEPARTMENT OF ENERGY DEFENSE NUCLEAR FACILITIES PANEL

Mr. KYL. Thank you. I join you in welcoming this afternoon's witnesses. This morning, the panel heard General Butler, the Commander in Chief of the Strategic Air Command, eloquently make the case for maintaining modern and effective strategic forces, even as those forces are coming down in number. We would be wise, in my judgment, to heed his counsel.

This afternoon, I am interested in receiving your views in the same areas that General Butler testified about. First, can we safely reduce our reliance on strategic offensive nuclear weapons beyond the level suggested by President Bush? In this regard, how should the United States respond to President Yeltsin's call for reducing between 2,000 and 2,500 strategic weapons?

Second, beyond simply describing the number of weapons that we need, how should these forces be postured? Are there further changes in our force posture that can be safely made beyond just taking the bombers off alert?

Third, to what extent can modern, effective conventional munitions replace nuclear weapons in our force planning? Fourth, how will the introduction of missile defenses affect the strategic balance and relationship of the United States and Russia? Should we be looking forward to an area in which missile defense becomes predominant over offensive forces?

I know that you bring unique and insightful perspectives to bear on these and related questions, and I look forward to hearing your testimony. Thank you.

Mr. SPRATT. I understand that both of you have already presented prepared testimony. As a matter of procedure, if there is no objection, I will make each of your statements a part of the record in its entirety. You can summarize as you see fit.

Now in your case, Mr. Reed, I think that this is the testimony that we are referring to. We will make it part of the record.

Mr. REED. That is the report, Mr. Chairman. Then I submitted a statement as well, a shorter version.

Mr. SPRATT. If there is no objection, we will make both part of the record.

Mr. May, we will make your testimony part of the record.

Mr. Reed, the floor is yours. We will hear testimony from both of you, and then put questions to you as a panel.

Thank you very much for coming.

STATEMENT OF THOMAS REED, FORMER SECRETARY, U.S. AIR FORCE

Mr. REED. Thank you, Mr. Chairman. I very much appreciate the opportunity to be here. This winter has provided an opportunity for all of us to look at a whole new landscape and explore totally new ideas as to where this country ought to go.

You and your chairman, Mr. Aspin, have displayed some real leadership. I am certainly honored to be here to share my views on this subject.

Last year, my associates and I tried to think about and address the role of nuclear weapons in the new world order. The result was a report that we have furnished you that Mike Wheeler and I authored. I had a couple of dozen colleagues in this enterprise and their names are listed in the back of the report. But of course, any errors of omission or commission that I make today are my own.

I thought that we would talk about the report very briefly. I thought that I would try this afternoon to touch briefly on four things. One is just the highlights of the report, to review what they were. Second, to illuminate a couple of areas of the report, where the findings do not enjoy universal agreement, and show you where they are.

Third, to talk about future scenarios, or more accurately what I think to be the futility of trying to define them. Then last, to end up with a one page one chart answer to the question of what is the role of nuclear weapons in the new world order.

What did the report say? First of all, it talked about the landscape. It said that nuclear weapons exist, that they cannot be uninvented. They have characteristics desired by some, who therefore want to acquire them. Nuclear weapons are in copious supply as the detritus of the Soviet Union.

I think that is an important concept. It means that the disappearing empire has left behind a vast nuclear arsenal, huge military forces, and an enormous though crippled military industrial complex. That the nuclear debris, or detritus, really constitutes a threat, not the current government of Russia.

The landscape also includes Third World states who are antagonistic to the United States, its friends and allies. They have resources to give substance to that hatred and they are trying to acquire weapons of mass destruction and the means of delivery.

Now I think that those qualifiers are important. Because simply to talk about Third World powers gives a bum rap to some very nice friendly countries—Liberia, Chile, Malaysia—who do not wish the United States ill.

The expression "The Cold War is Over" means that there is little threat of a massive conventional invasion of Western Europe, at least for now. It also means that the American and the Russian people are beginning to focus on mutual interests and friendships, so far devoid of recrimination and bitterness.

We cannot avoid the Soviet nuclear legacy when we think about the new world order. But among the things that we concluded, is that we do not really have to foresee the outcome of the current turmoil over there to reach some conclusions about our own security.

The future is not certain and it never is. We have not reached the end of history, only a fortunate flood tide that can lead on to good fortune if we are wise.

So why do nations want nuclear weapons? Well, I think you have to answer that in categories. First of all, the United States wishes to deter aggression that threatens our survival. We want to protect our allies with a nuclear umbrella, therefore dissuading them from going nuclear. If we wish to provide leadership in the world where others have nuclear weapons, we had best maintain a safe and secure inventory of our own.

Second, other nuclear weapons states, for example everybody from the U.K. and France to Israel and India, probably wish to deter aggression, especially by long time local rivals. To varying degrees, they enjoy the status of being nuclear club members. A nuclear umbrella for their allies probably is not as important to them as it is to us.

Antagonistic and resourceful Third World powers want weapons of mass destruction to terrorize and coerce as a status symbol and to deter. But to deter who? They wish to deter the United States from intervening in their local affairs, which we may not consider to be local, and which is a very new concept in this world.

Last, fragments of the Soviet Union have simply inherited the nuclear legacy. Weapons are there under dubious control. They are seen by some republic leaders as insurance against future inter-republic aggressions. But revolutions break old bonds of discipline and they unleash passions to settle old scores. The poverty of the republics shifts loyalties. Therefore, all in all there is an enormous opportunity for disaster in these "loose nukes."

On the other hand the industrial heavyweights—most of Europe, Japan, South Korea, Taiwan, Argentina, and Brazil among others—have so far forsworn nuclear weapons because they feel comfortable without them. They could produce them if they wanted to. Dissuading them from that option is an important American challenge.

So how many weapons? The subject of discussion this morning. If we talk about strategic nuclear weapons, we have to start with our current inventory and think about the reasons for reducing nuclear weapons in the U.S. inventory. There are several reasons that we would want to do that.

First of all, the present large inventory simply is not needed to cover any reasonable set of targets in the new world order. Most people agree that we should get rid of things that we do not need. This is especially true if some of these things are dangerous. Some nuclear weapons are old, while some are inherently safe. Some are quite secure, like warheads in silos. Some are not, like artillery shells deployed in foreign countries. It is important to focus on the problem weapons when we invoke this criteria.

Third, defense expenditures must be cut and it is assumed that weapons on hand drive the budget. While this is true when building and deploying new systems, it may not be true on the margin, since reducing existing force structure may do little to reduce infrastructure costs. When reducing forces in a START environment, if the treaty is truly complex, the treaty constraints may even increase costs.

Some will argue that lower force size discourages proliferation. We think that this is at best a third order reason. While Third World representatives may point with alarm at the superpowers' arms inventories, we thought it unlikely that Saddam Hussein would have been seriously influenced by any U.S. arms reductions. To be fair, however, a general downward trend may be helpful to the leaders of a fragile democracy in forgoing a weapons program.

In fact, lower force sizes may encourage proliferation. If the United States moves from being a superpower to being an equal, other states may wish to be equals as well.

Last, force reductions are certainly worth it if we get something of value in return, and that is really the bottom line. Do we get the removal of Soviet weapons that threaten us, especially those threatening us in an unstable and hair-trigger way?

Any proposed course of action that reduces the number of weapons must therefore draw its legitimacy from one or more of these considerations. Some minimum force structure is in order. A strategic weapons inventory of 5,000 plus or minus 20 percent seems a reasonable objective today, that is to say this week. As I hope that we will explore this afternoon, that may not be the case next week or next month. Hopefully, these numbers are but way-stations on the journey to a safer and more secure world. Because there is not any end-game in the military balance, just as there is no end of history.

When you talk about nuclear weapons and the inventory, we need to talk about flexibility. Given the Soviet situation, the possible instabilities associated with the remaining Marxist powers, and the proliferation of weapons of mass destruction, new attention has to be given to adding some flexibility to U.S. weapons employment planning. But since flexibility can become chaos during a crisis, and since any changes to the SIOP can add to that problem, changes to the SIOP have got to be very carefully thought through from the start.

There are several compelling reasons for retaining an orderly process to construct pre-planned options for the use of nuclear weapons. First of all, the threat of the SS–18s—we know where they are. The threat is not the current government; the silos are fixed and we can plan to deal with them.

By far the most important reason for sticking with pre-planned options is that nuclear weapons cannot be treated casually. The decision to release them for whatever purpose must remain very structured, with every effort being made to stop the errors of exhaustion and the fog of war from creeping in.

Studies of the nuclear forces then get down to the specifics of what to do about the forces. We concluded that the triad concept of strategic forces, tied into the national command authorities by a robust and survivable C^3I systems, continues to make sense. This concept remains even more valid in the New World order as we put fewer eggs into smaller baskets.

ICBMs are the most cost effect leg of the triad and some should be retained as single R/V missiles. We simply cannot afford mobility.

There appears to be no ASW threat to our Trident fleet of SSBNs. Thus, we should continue to rely on the planned eighteen boats with their current alert rates. There is little inherent safety increase, stability improvement, or cost reduction to be gained by de-MIRVing, or even downloading R/Vs on Trident missiles except in two situations: One, to get the Soviets to do something on land that we want them to do; or second, to simplify targeting, to increase range, and/or to accommodate heavier warheads.

Given those possibilities, it certainly seems that downloading from eight R/Vs to at least five or six R/Vs per missiles seems a reasonable thing to do and could be helpful.

Bombers will play an ever important role in the New World order because they are not destabilizing, they can carry large payloads, and because they are very flexible. They can be safely reassigned from a SIOP role to other theaters, so long as confidence remains high in the survivability and reliability of the two missile legs of the triad. What that means is that should one family of missiles develop temporary technical problems, such as aging, we may be tempted to temporarily, or we should temporarily put bombers back on alert.

Stealth is already enormously important and cost-effective in a bomber. The benefits of the technology were amply demonstrated in the Gulf where there were no losses in the most difficult missions into severe defense environments by F–117 aircraft. The B–2 payload is very large, perhaps allowing one aircraft to accomplish an entire contingency mission. The continued procurement of the B–2, unfortunately expensive as it is, seems like the prudent thing to do.

Given those forces, of course, we then have to talk about having sound nuclear weapons in them. The four major issues now impacting the Department of Energy complex are: Safety, which means the resistance to dropping, explosion, fire and so forth; security, making weapons theft-proof; the environmental status of the production complex; and the ongoing debate on whether the United States should cease nuclear testing as part of a comprehensive test ban.

The United States will continue to need a nuclear weapons complex to support the forces that we have just talked about, with even higher levels of safety and security, as well as to disassemble retired weapons rapidly and safely. At a minimum, that means design laboratories, tritium production and plutonium fabrication facilities, and some degree of nuclear testing.

Now with the last, let me focus very briefly on what was contentious in the report. There were two topics which certainly enjoyed the uniform agreement of our group but that are the subject of public debate and correctly so. One is the matter of no first use.

Some people have argued that the United States can discourage nuclear proliferation by confirming a highly visible declaratory policy that American nuclear weapons serve no purpose other than to deter other nuclear weapons.

We as a group are not comfortable with the implications of that argument, that a nation can engage in any level of chemical or especially biological aggression and be shielded by an American nonnuclear pledge. We doubt that Saddam Hussein's decisions on pursuing nuclear weapons, or the decisions of future like minded aggressors, would be influenced even marginally by such a U.S. policy.

The chance that the United States would use nuclear weapons in a regional conflict is remote. But a policy of last resort is appropriate here as in Europe. Our declaratory policy should be deliberately ambiguous.

The second contentious issue is the matter of a comprehensive test ban. Some feel that continued testing of nuclear weapons by the major powers may encourage proliferation. Continued underground testing, even if focused on weapon safety and security, may produce political heat. But it is not clear that a CTB would have any influence or effect on possible real world proliferants such as Iraq, or Iran, or Libya, or North Korea, or Algeria.

We concluded that it is not in the U.S. interest to negotiate a Comprehensive Test Ban Treaty, nor to agree to a moratorium that would become a de facto treaty. To ensure a safe and secure nuclear posture, to hedge against the uncertainties associated with new nuclear technologies including the disablement of terrorist bombs, to retain the ability to respond to a radical reversal in world politics, to assure the reliability of existing weapons, and to do all of this in an environmentally acceptable production complex, some degree of nuclear testing is advisable so long as the United States has nuclear weapons.

With that summary of the report, let me just talk about two aspects of all of this that have become clear to me as I have talked about this over the past few months. The first is the issue of uncertainty, or what could be called the seven scenario flap, the problems that arise when people try to write down where are we going from here.

The expression "The Cold War is Over" tempts one to carelessness, I think. Because since the end of World War II, our national leadership has never perceived what each coming decade really held. Consider the credibility of a speaker standing up on January 1st of each decade forecasting as follows:

Suppose on January 1st in 1950, the speaker said that within 8 months we will nearly lose a land war in Korea, or that would forecast that by the end of the decade in 1959 that the winning candidate for president would decry the loss of American nuclear superiority, using the expression "the missile gap." That was not very credible in 1950.

Suppose in 1960, at the end of the Eisenhower golden years, that a speaker predicted another Asian land war, one that we would lose with 50,000 dead. Suppose that that speaker predicted that in 1969, at the end of the decade, Washington, DC, itself would be a battleground in that war. It was not very credible.

Suppose on January 1, 1970 that a speaker forecast that OPEC would seize control of the petroleum market, embargoes and all. In the middle of all of that, the President would resign.

Suppose the forecast at the end of the decade of 1979 was that the Shah or Iran would actually flee Iran and oil would be $40 a barrel. In the golden plenty of 1970 with gasoline at 25 cents a gallon, not many people would have believed that.

Suppose in January of 1980, when President Carter and General-Secretary Brezhnev squared off as a result of the invasion of Afghanistan, that the speaker had predicted the collapse of world communism, and that in 1989 the Berlin Wall would be swept away bloodlessly. Would we really have believed that?

Suppose on January 1, 1990, which is only a couple of years ago, that a speaker had forecast that the United States would lead a brilliant military rescue of occupied Kuwait.

Or if they forecast something in 1999. What? Jean LaPen as president of France; or Hong Kong as the manager of China's business finances; or North Korea deploying [illegible] nuclear weapon or exploding a nuclear weapon on some Japanese asset. We do not know. Any of those forecasts would sound absurd, even the correct one.

The point of all of this, and the point that I think is terribly important for you ladies and gentlemen, is that history is full of twists and turns. It is best to be prepared for the worst, or at least not be surprised by it, and to be postured to enjoy or even to exploit the best. But we should never extrapolate a single straight line from here to a happy tomorrow just because "The Cold War is Over." Life simply does not work that way.

So let me close with a conclusion. What is the answer to the question, "What is the role of nuclear weapons in the New World order?" Well, I think that the threats to our security that require U.S. ownership of nuclear weapons really can be condensed down into three threats and three reasons.

The first threat is the Soviet nuclear detritus. For example, the weapons, and the forces, and the military industry left behind by the Soviet empire.

What is the role of nuclear weapons, U.S. nuclear weapons? It is to deter those who control or who could control the Soviet legacy until it is gone. In the process, to act as bargaining chips in bringing about that dissolution.

The second threat is those who would aggravate our industrial allies. That is not the same thing as "attack" or "irritate." By aggravate, I am talking about aggressors such as China or North Korea in the Orient, or a revisionist republic in Europe. Or I am talking about competitors, who would challenge the status, the respect of these major industrial powers who will want seats on the Security Council. The role of U.S. weapons, I think, is to provide the assurance of a nuclear umbrella, thus to dissuade our industrial allies from going nuclear.

The third threat are these Third World antagonistic resourceful states, which are currently Iraq, Iran, North Korea, Libya, and Algeria. That list can lengthen or shorten with history.

The role of U.S. nuclear weapons is to deter, as a last resort, the use of weapons of mass destruction or other unconscionable acts in ways that we now only dimly perceive. We cannot know how these threats will play themselves out. I think that it is best to prepare for difficult possibilities, while trying to entice history into civilized channels.

Thank you, Mr. Chairman.

Prepared Statement of Thomas C. Reed

Mr. Chairman and members of the committee, I am pleased to have the opportunity to appear before you today to discuss the role that U.S. nuclear weapons can and should play in our emerging security environment.

You have copies of the report on this subject that Mike Wheeler and I co-authored in January of this year. We were fortunate during 1991 to have the opportunity to discuss this nuclear weapons question with a number of our colleagues, listed in the first annex of the report. They have spent their careers dealing with the ambiguities and challenges of nuclear weapons.

The conclusions I deliver here today, however, are my responsibility. Any errors of omission or commission are mine alone and should not be attributed to the exceptional men and women who contributed to our study.

WHAT DID THE REPORT SAY

The New World Order

Nuclear weapons exist. They cannot be uninvented, and they have characteristics desired by some who thus wish to acquire them.

Nuclear weapons are in copious supply as the detritus of the Soviet Union. That disappearing empire has left behind a vast nuclear arsenal, huge military forces, and an enormous (though crippled) military industrial complex.

Third World states, antagonistic to the United States, its friends and allies, with the resources to give substance to that hatred, are trying to acquire weapons of mass destruction and the means of delivery.

"The Cold War is Over" means there is little threat of a massive conventional invasion of Western Europe, at least for now. It also means the American and Russian people are beginning to focus on mutual interests and friendships, so far devoid of recrimination and bitterness toward each other.

We cannot avoid the Soviet nuclear legacy when thinking about the New World order, but we need not foresee the outcome of the current turmoil there to reach some conclusions about our own security.

The future is never certain. We have not reached the "End of History", only a fortunate floodtide that can lead on to good fortune if we are wise.

Why Do Nations Want Nuclear Weapons

The United States wishes to deter aggression that threatens our survival. We want to protect our allies with a nuclear umbrella—thus dissuading them from going nuclear. If we wish to provide leadership in a world with nuclear weapons, we had best maintain a safe and secure inventory of our own.

Other nuclear weapons states also wish to deter aggression, especially by longtime rivals, and to varying degrees they enjoy the status of nuclear club membership. A nuclear umbrella for their allies may not be as important to them.

Third World, antagonistic, resourceful powers want weapons of mass destruction to terrorize and coerce, as a status symbol, and to deter. But deter who? They wish to deter the United States from intervening in their "local affairs"—which we may not consider to be "local" at all.

Last, fragments of the Soviet Union have simply inherited the nuclear legacy. Weapons there are under dubious control. They are seen by some as insurance against future inter-Republic aggressions. Revolutions break old bonds of discipline and unleash passions to settle old scores. The poverty of the Republics shifts loyalties. There is an enormous opportunity for disaster in these "Loose Nukes."

On the other hand, the industrial heavyweights (most of Europe, Japan, South Korea, Taiwan, Argentina, and Brazil) have forsworn nuclear weapons so far because they feel comfortable without them. They could produce them if they wanted to. Dissuading them from that option is an important American challenge.

How Many U.S. Weapons

There are several sound reasons for reducing the numbers of nuclear weapons in the U.S. Inventory.

First of all, the present large inventory simply is not needed to cover any reasonable set of targets in the New World order, and most people agree we should get rid of things we don't need.

This is especially true if these things are dangerous. Some nuclear weapons are old, while some are inherently safe. Some are quite secure (strategic warheads in silos) and some are not (artillery shells deployed in foreign countries.) It is important to focus on the problem weapons when invoking this criteria.

Third, defense expenditures must be cut, and it is assumed that weapons on hand drive the budget. While this is true when building and deploying new systems, it may not be true on the margin, since reducing existing force structure does little to reduce infrastructure costs. When reducing forces in a START environment, treaty constraints may even increase cost.

Some will argue that lower force sizes discourage proliferation. This is, at best, a third-order reason. While Third World representatives may point with alarm at the superpowers' arms inventories, it is unlikely that Saddam Hussein would have been seriously influenced by any U.S. arms reductions. A general downward trend, however, may be helpful to the leaders of a fragile democracy in forgoing a weapons program.

In fact, lower force sizes may encourage proliferation. If the United States moves from being a superpower to being an equal, others may decide to become equals as well.

Last, force reductions are certainly worth it if we get something of value in return, i.e., the removal of Soviet weapons threatening us, especially those threatening us in an unstable, hair-trigger way.

Any proposed course of action reducing numbers of weapons must draw its legitimacy from these considerations.

Some minimum force structure is in order. A strategic weapons inventory of 5,000 ± 20 percent seems a reasonable objective today. Hopefully this is but a way-station on the journey to a safer and more secure world, for there is no "end game" in military balance, just as there is no "end of history".

Flexibility

Given the Soviet situation, the possible instabilities associated with the remaining Marxist powers, and the proliferation of weapons of mass destruction, new attention must be given to adding some flexibility to U.S. weapons employment planning. But since flexibility can become chaos during a crisis, any changes to the SIOP process must be carefully thought through.

There are several compelling reasons for retaining an orderly process to construct pre-planned options for the use of nuclear weapons. By far the most important is that nuclear weapons cannot be treated casually. The decision to release them, for what purpose, must remain very structured, with every effort being made to stop the errors of exhaustion and the fog of war from creeping in.

The Triad

The concept of a triad of strategic forces (ICBMs, SLBMs and bombers) tied together and to the NCA by a robust and survivable C^3I system continues to make sense. This concept remains even more valid in the New World order as we put fewer eggs into smaller baskets.

ICBMs are the most cost-effective leg of the triad and some should be retained as single R/V missiles. We cannot afford mobility.

There appears to be no ASW threat to our Trident fleet of SSBNs. Thus we should continue to rely on those eighteen boats with their current alert rates.

There is little inherent safety increase, stability improvement, or cost reduction to be gained by de-MIRVing, or even downloading R/Vs, on Trident missiles except:

a. To get the Soviets to do something on land that we want them to do, and/or
b. To simplify targeting, increase range, and/or accommodate heavier warheads.

Thus downloading from eight to an average of five or six R/Vs per missile seems reasonable and could be helpful.

Bombers will play an ever-more-important role in the New World order because they are not destabilizing, can carry large payloads, and are very flexible.

They can be re-assigned from a SIOP role to other theaters so long as confidence remains high in the survivability and reliability of the two missile legs of the triad.

Stealth is already enormously important (and cost effective) in a bomber. The benefits of the technology were amply demonstrated in the Gulf. (No losses on the most difficult missions into severe defense environments.) The B–2 payload is very large, allowing one aircraft to accomplish an entire contingency mission. The continued procurement of the B–2 seems necessary.

Sound Nuclear Weapons

The four major issues now impacting the DOE weapons complex are: Safety (i.e., resistance to dropping, explosion, and fire); security (making weapons theft-proof); the environmental status of the production complex; and the ongoing debate on whether the United States should cease nuclear testing as part of a Comprehensive Test Ban.

The United States will continue to need a nuclear weapons complex to support the forces described earlier as safely and securely as possible as well as to disassemble retired weapons.

At a minimum, that means design laboratories, tritium production and plutonium fabrication facilities, and some degree of nuclear testing. (Conversion to tritium-free designs would require a massive program of testing, plutonium fabrication, and new manufacture.)

WHAT'S CONTENTIOUS IN THE REPORT

No First Use

Some have argued that the United States can discourage nuclear proliferation by confirming a highly visible declaratory policy that American nuclear weapons serve

■■ purpose except to deter other nuclear weapons. We were not comfortable with the implications of that argument, that ■ nation can engage in any level of chemical or biological aggression and still be shielded by an American non-nuclear pledge.

We doubt that Saddam Hussein's decisions on pursuing nuclear weapons—or the decisions of future, like-minded aggressors—would be influenced, even marginally, by such U.S. policy.

The chance that the United States ever would use nuclear weapons in ■ regional conflict is remote. But a policy of last resort is appropriate here as in Europe. Our declaratory policy should be deliberately ambiguous.

Comprehensive Test Ban

In ■ similar vein, some feel that continued testing of nuclear weapons by the major powers may encourage proliferation.

Continued underground nuclear testing, even if focused on weapon safety and security, may produce political heat. But it is not clear that a CTB would have any effect on possible real-world proliferants (e.g. Iraq, Iran, Libya, North Korea, or Algeria).

We concluded that it is not in the U.S. interest to negotiate ■ Comprehensive Test Ban Treaty, nor to agree to a moratorium that would become ■ de facto treaty. To ensure a safe and secure nuclear posture, to hedge against the uncertainties associated with new nuclear technologies including the disablement of terrorist bombs, to retain the ability to respond to a radical reversal in world politics, to assure the reliability of existing weapons, and to do all this in an environmentally acceptable production complex, some degree of nuclear testing is advisable so long as the United States has nuclear weapons.

UNCERTAINTY

"The Cold War is Over" tempts one to carelessness. Since the end of World War II our national leadership has never perceived what each coming decade really held. Consider the credibility of ■ speaker on January 1 of each decade, forecasting:

January 1, 1950

- Within 8 months we will nearly lose a land war in Korea.
- In 1959, the winning candidate for president will decry the loss of American nuclear superiority, the "Missile Gap".

January 1, 1960

- Another Asian land war, this one we will lose, with 50,000 dead.
- In 1969, Washington DC, itself will be ■ battleground in that war.

January 1, 1970

- OPEC will seize control of the petroleum market, embargoes and all. In the midst of all that the President will resign.
- In 1979, the Shah will flee Iran and oil will be $40 per barrel.

January 1, 1980

- World Communism will simply collapse.
- In 1989 the Berlin Wall will be swept away, bloodlessly.

January 1, 1990

- The United States will lead a brilliant military rescue of occupied Kuwait.
- By 1999: What? We don't know. Any forecast, even the correct one, would sound absurd.

The point of all this is that history is full of twists and turns. It is best to be prepared for the worst—or at least not be surprised by it—and to be postured to enjoy, even to exploit, the best. But never should we extrapolate ■ single straight line from here to a happy tomorrow. Life doesn't work that way.

CONCLUSIONS

The threats to our security requiring U.S. ownership of nuclear weapons are threefold.

The Threat	Examples	Role of U.S. Weapons
1. The Soviet nuclear detritus ...	Weapons, forces, and military industry	To deter those who control (or could control) the Soviet legacy until it is gone. To act as bargaining chips in bringing that dissolution about.
2. Those who would aggravate our industrial allies.	Aggessors (e.g., China, North Korea, a revisionist Republic) or competitors.	To provide the assurance of a nuclear umbrella, thus to dissuade our industrial allies from going nuclear.
3. Third world, antagonistic, resourceful states.	Iraq, Iran, North Korea, Libya, Algeria	To deter, as a last resort, the use of weapons of mass destruction or other unconscionable acts.

We cannot know how these threats will play themselves out. We must prepare for difficult possibilities while trying to entice history into civilized channels.

THE ROLE OF NUCLEAR WEAPONS
IN
THE NEW WORLD ORDER

by

Thomas C. Reed and Michael O. Wheeler

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EXECUTIVE SUMMARY

ISSUE: ***THE ROLE OF NUCLEAR WEAPONS IN THE NEW WORLD ORDER***

MAJOR CONCLUSIONS:

- Nuclear weapons and concerns about their possible use will remain a central, albeit likely muted, dimension of the post-Cold War world. No state that currently possesses a nuclear option will renounce it for the foreseeable future, with the possible exception of some former Soviet republics -- now sovereign states -- with nuclear weapons on their territory at the point they achieved statehood.

- More nuclear-weapons states are likely to emerge, especially in the more unstable regions of the Third World. Those also are the regions where advanced delivery technologies and other lethal weapons capabilities (e.g., chemical and biological) are likely to proliferate, despite vigorous diplomatic and legal efforts to contain proliferation.

- Notwithstanding the above, the United States has a dramatic opportunity to influence the size and characteristic of future nuclear forces. The largest concentration of nuclear weapons resides in the arsenals of the U.S. and the former USSR, which were sized and postured largely against one another during the Cold War. The collapse of communism in the former USSR clearly changes the nature of the interaction of these massive nuclear arsenals.

- The successor authorities to the former USSR are grappling with severe internal problems as they maneuver to reorganize the distribution and center of political, economic, and military power. The outcome is highly uncertain, may not be clarified for years to come, and may not yield the democratic results that are hoped for.

- Whatever the outcome, the new political authorities will possess formidable military forces, including nuclear weapons (at least in the case of Russia), well into the future. The U.S. should continue to engage the successor authorities in a wide range of activities -- formal negotiations, technical talks, reciprocal drawdowns -- aimed at the evolution of smaller, more stable, safer, more secure nuclear postures on both sides.

- Liberal leaders currently have moved to the fore in large parts of the former USSR. This is an encouraging development, and should be supported. At the same time, the U.S. must sustain a nuclear deterrent dealing with the reality that if events change and a hostile group of successor authorities come to power, they will possess the ability to destroy the United States in a single, apocalyptic blow.

- In the Third World, the discoveries about the extent, pace, and sophistication of the Iraqi nuclear weapons program provide a sobering picture of how a despotic Third World power can pursue a nuclear option. Countries like Iraq are drawn to nuclear weapons for many reasons, including the powerful motive that with such weapons, they can seek to deter the United States and others from interfering with their regional aggressions.

- In the absence of a credible nuclear deterrent extended by the United States, Germany and Japan may over the long term opt for a nuclear option of their own, despite other prohibitions and inhibitions.

- The United States thus has multiple reasons for retaining nuclear weapons: deterrence, positive reassurance of key allies and friends, and the ultimate option of retaliation if nuclear deterrence fails. Moreover, in a world where others have nuclear weapons, the United States cannot exercise leadership unless it also has a nuclear arsenal.

- As the United States disengages from the Cold War and seeks to influence the evolution of a new world order, its stance toward nuclear weapons will be important in a number of subtle ways. Responsible stewardship of the American nuclear arsenal sets an example for others. Adapting new technologies for non-nuclear warfare can raise the nuclear threshold. An orderly, reasonable adjustment of forces no longer needed, accompanied by compelling rationales for forces retained, inspires confidence in American leadership.

- In the final analysis, however, and for all the hopes and expectations attending the end of the Cold War, the world remains a dangerous place. American nuclear weapons continue to have a role in U.S. efforts to manage its security problems in a dependable, effective fashion.

- Given the above, the future U.S. nuclear posture should be:

  - Smaller, reduced in an orderly fashion keyed to reciprocal reductions by the forces of the former USSR. A strategic weapons inventory numbering in the 5,000 range (plus or minus 20%) seems an intelligent objective today, but there are too many uncertainties to commit to a firm figure far into the future. The U.S. arsenal should retain parity with the nuclear forces of the former USSR, and also must maintain a substantial margin over the other world nuclear powers, if the U.S. expects its extended deterrent to remain viable.

  - Safer, which requires a sound DOE nuclear weapons complex and continued nuclear testing. At a minimum, the U.S. requires weapons design laboratories, tritium production, plutonium fabrication, and some degree of nuclear testing.

  - Credible and stabilizing, capable of meeting national guidance, with highly trained and maintained nuclear forces, robust C3I, and a new alert posture supported by sound strategic warning. Removing bombers from alert and dramatically reconfiguring theater and maritime nuclear forces makes sense, in light of changed conditions. In the future, the U.S. also will need some ballistic missile defenses, especially to deal with Third World threats where deterrence is highly problematic. The arguments for maintaining a strategic nuclear triad still are valid, but the force mix increasingly can shift more toward the SLBM leg. The U.S. should have at least one large combat aircraft and one ballistic missile in development or production into the foreseeable future, and the next generation SSBN should be planned while boatyards retain competency with the requisite technologies.

- Supported by a new planning structure for the SIOP, and a new set of integrated plans. The new planning structure should incorporate more adaptive planning, but retain the benefits of a highly structured process. The new plans should adapt to emerging realities, and pay even more attention to escalation control in the emerging world.

PREFACE

What is the role of nuclear weapons in the post-Cold-War world? The question is simple, but the answers are not. As Professor Lawrence Freedman points out, " [nuclear] weapons remain as instruments of strategy, and before we assume that they no longer serve any strategic purposes we need to understand better than we do at the moment the sort of strategic purposes that might arise in the post-Cold-War political environment."[1]

In what follows, we undertake to provide some perspective and thoughts on answering the fundamental questions posed above. We were fortunate to have the opportunity to look deeply into the issue during most of 1991, in conjunction with a number of our professional colleagues who have spent long portions of their careers dealing with nuclear weapons areas.[2]

The breadth of the fundamental questions -- and the many answers they elicit -- almost guarantee that informed commentators will differ on at least part of the response. We hope the subsequent discussion will help inform and focus the emerging public debate on one of the truly monumental issues of our time -- the future of nuclear weapons.

INTRODUCTION: THE EVENTS OF 1989-1991

U.S. security policy in the old world order was largely dominated by the Cold War -- a confrontation between alliances led by the U.S. and USSR which took place in Europe, in the Third World, at sea, in space, and across intercontinental distances with nuclear weapons .

For almost half a century, the two superpowers acquired and modernized large nuclear forces. By the end of the 1980's, the U.S. and the USSR had arsenals collectively including some 50,000 nuclear weapons. These weapons were deployed on [redacted] wide assortment of delivery systems, many of which [redacted] kept in [redacted] state of constant alert, ready to respond at a moment's notice.

Throughout this period, the U.S. sized and postured its strategic nuclear forces largely in terms of the Soviet threat. The flexibility built into this force allowed sufficient options for applying American nuclear power, where relevant, to dealing with other threats.

The Berlin Wall -- perhaps the premier symbol of the Cold War -- fell in late 1989, and the collapse of European communism accelerated. Throughout 1990, the U.S. engaged in negotiations on many fronts, and by the end of the year, Germany was reunited, still [redacted] member of NATO. It [redacted] in this evolving context that President Bush took the occasion of the 40th anniversary of the Aspen Institute to outline a new strategic concept for American security in the post-Cold War world. The President delivered the speech to the Aspen Institute on 2 August 1990 -- the day Iraq invaded Kuwait.

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1. Lawrence Freedman, "Whither Nuclear Strategy?", in Ken Booth, ed., *New Thinking About Strategy and International Security* (1991).
2. Major contributors to this study [redacted] listed in Annex A. The thoughts and comments of the contributors have vastly enriched the authors' views. However, the conclusions expressed in this study are those of the authors, and errors of omission or commission likewise are the authors' responsibility.

In the Aspen speech, the President stated that the threat of a Soviet invasion of Western Europe launched with little or no warning was more remote than at any other time in the the post-war period. He also observed, however, that the Soviet Union remained a world-class military power which continued to maintain and modernize an arsenal of strategic nuclear weapons. The President concluded that prudence demands that the U.S. maintain an effective deterrent, one that secures the peace not only in a climate of reduced tensions, but that ensures that renewed confrontation is not a feasible option for any Soviet leadership.

His speech had been modified at the last moment to emphasize that the brutal Iraqi aggression illustrated a central feature of the emerging international environment: notwithstanding the alteration in the Soviet threat, the world remained a dangerous place with serious military challenges to important U.S. interests.

In January 1991, President Bush announced he was ordering that the Strategic Defense Initiative be reoriented toward a Global Protection Against Limited Strikes (GPALS) system which would emphasize defenses against small, unauthorized or accidental ballistic missile launches, or limited Third World threats. And as the American response to the Gulf crisis unfolded and the situation worsened in the USSR (illuminated by Eduard Shevardnadze's resignation speech on 20 December 1990), Administration officials prepared the FY 1992 defense budget.

In materials submitted to the Congress, which gave the supporting rationale for the budget request, the Administration argued that strategic deterrence would remain the cornerstone of American defense policy for the foreseeable future. Strategic deterrence also was reaffirmed as the most basic concept of U.S. military doctrine. Senior civilian and military officials of the Defense Department certified that strategic deterrence would be first and foremost among central U.S. military concepts, and thus would continue to be the motivating and organizing concept for America's armed forces.

In early 1991, global audiences who earlier had watched the Berlin Wall collapse now watched the American-led coalition eject the Iraqis from Kuwait in the most intense air and ground campaigns since World War II. In August 1991, television carried gripping images of a coup failing in the USSR, and of the subsequent destruction of the symbols of Soviet communist rule. In September 1991, television viewers watched as Iraqi authorities temporarily detained United Nations inspectors who had acquired new evidence of the unexpected pace, scope, quality, and global connections of the Iraqi nuclear weapons program.

President Bush spoke to the American people on 27 September 1991, announcing a sweeping initiative on nuclear weapons. The initiative addressed such issues as the characteristics and alert posture of strategic nuclear forces, changes in theater and maritime nuclear forces, the requirements for missile defenses, engaging the Soviets in discussions on safety and control of their nuclear arsenal, next steps in arms control, the need to accelerate dealing with the proliferation of advanced weapons, and so forth.

Events in the post-coup USSR intensified the urgency of the initiative, as various factions maneuvered for power and as the threat of a fragmenting nuclear power grew. By the end of 1991, the Soviet Union had dissolved, to be replaced by an embryonic Commonwealth of Independent States which possessed the nuclear arsenal of its predecessor.

In the context of these rapidly evolving events, what follows is an attempt to think through in [illegible] comprehensive fashion the role of nuclear weapons in the new world order. The U.S. now is in a transition toward a new nuclear posture. This study explores relevant considerations affecting that posture and its associated policies.

BACKGROUND

The nuclear [illegible]

Since 1945, American citizens have lived with nuclear weapons. The U.S. nuclear test in the New Mexico desert in July of that year ushered in this perilous new era. The two primitive fission bombs dropped on Japan in August 1945 caused approximately 150,000 immediate casualties and shocked the Japanese authorities into surrendering to end the Second World War. Coping with a world in which nuclear weapons exist has been a shared national experience for half [illegible] century.

During this time, five other nations have publicly acknowledged testing nuclear devices: the USSR (1949), the UK (1952), France (1960), China (1964), and India (1974). India claims it has not produced nuclear weapons, but certainly is capable of (and already may have started) weaponizing its nuclear technology. Israel probably also has [illegible] modest nuclear arsenal. There is strong evidence that [illegible] number of other states have nuclear weapons programs at varying stages of completion.

It is easier today for a fledgling nuclear-weapon state to develop nuclear weapons than was the [illegible] in past years. Nuclear technology is [illegible] widely understood, associated nonnuclear components [illegible] more readily available in international commerce, and the accelerating growth of the diffuse global technology market makes enforcement of export controls less than leakproof.

Given the widespread knowledge of basic nuclear physics and weapons engineering, it is conceivable that a nation could design and stockpile nuclear weapons without first testing them. Third World nations appear ready to develop and use other relatively advanced weapons, e.g., ballistic missiles, with minimal testing programs. That may be their approach to nuclear weapons as well. The post-war revelations about the Iraqi nuclear program lend weight to new fears about nuclear weapons proliferation.

Today the nuclear weapons landscape is dominated by the United States and the successor authorities in the former USSR.

That landscape also features several states that acknowledge having nuclear arsenals, that pos[illegible] nuclear weapons covertly, or [illegible] capable of creating such weapons fairly quickly, [illegible] they [illegible] choose: the UK, France, China, possible breakaway Soviet republics, Israel, India, Pakistan, and South Africa.

Other states -- North Korea, Libya, Iran, and Algeria -- are suspected of actively pursuing, a nuclear weapons capability. As UN inspections continue in Iraq, more details [illegible] coming to light on the extent and sophistication of the Iraqi nuclear weapons program. Although the terms of the

Security Council resolutions clearly inhibit the Iraqi nuclear program, the uncooperative stance of Iraqi authorities and the widespread technical knowledge possessed by Iraqi scientists and engineers make it is too early to conclude that the program has been brought to [illegible] conclusive end.

The possibility that terrorist groups will acquire nuclear weapons cannot be discounted. Any informed study also must recognize that there are other powers that have the industrial infrastructure and proven technical capability to pursue [illegible] nuclear weapons program, including Germany, most of the rest of Europe, Japan, South Korea, Taiwan, Argentina, and Brazil. And still other states can be expected to possess financial resources which may be used to purchase such infrastructure and/or weapons.

The end of the Cold War understandably marks the emergence of a period in which Cold War assumptions and truisms are undergoing sweeping reassessment. The collapse of communism gave birth to [illegible] new stage in world history.

This is a time of soaring hope. It also is [illegible] time of great uncertainty and latent danger. Not only has history resumed in the sense of national and ethnic rivalries which were overshadowed by the Cold War, but nuclear weapons remain a fact of life.

This is the starting point for any discussion of the role of nuclear weapons in the new world order.

Chemical, biological, and more lethal conventional weapons

Even if nuclear weapons do not spread beyond the current nuclear powers, other highly lethal weapons capabilities [illegible] likely to proliferate to a larger number of states, along with advanced delivery systems. The increased likelihood of the use or threat of [illegible] of such weapons against the United States, its forces deployed abroad, or its allies or friends poses a major challenge to U.S. security policy in the new world order.

Depending on circumstances such as weather, chemical weapons can cause relatively few or mass casualties. Used against unprepared populations under favorable weather conditions, chemical weapons may, by some estimates, be 500 times more deadly than [illegible] similar amount of conventional explosives. Even used against [illegible] well-prepared population under weather conditions which prevent the optimum dispersal of the chemical agent, chemical munitions are likely to be more deadly. However, compared to [illegible] Hiroshima-sized nuclear weapon, chemical weapons would result in far fewer deaths.

On the other hand, biological weapons can approach nuclear weapons in lethality. And unlike chemical agents, the most persistent of which might pose [illegible] continuing hazard to large numbers of humans for only up to [illegible] few weeks, biological weapons may persist in the soil in deadly form for decades. More lethal conventional weapons, e.g., fuel-air explosives, coupled with advanced delivery systems, also could pose [illegible] increasing threat in the future.

The technology for manufacturing advanced non-nuclear weapons is widely available, and shares much of the infrastructure required for modern chemical, pharmaceutical, bioengineering, and other commercial industries. Especially in the Third World, chemical and biological weapons have been seen by some leaders [illegible] [illegible] "poor man's nuclear weapon."

Although efforts are underway to strengthen the regimes for inhibiting proliferation of chemical and biological weapons and offensive missile systems, the U.S. must be prepared to cope with more lethal non-nuclear threats to U.S. interests in the new world order.

Objectives for U.S. nuclear weapons

Successive American presidents have stated in no uncertain terms that nuclear war would be catastrophic. However, they also have issued guidance for U.S. nuclear forces, recognizing that whatever ultimate aspirations many people might have for a world free of nuclear weapons, the fact is that those weapons exist, and U.S. policy must deal with that fact. Embedded in the guidance have been the following objectives which have attended the development of the American nuclear posture during the Cold War era:

- Maintaining effective deterrence so that a potential aggressor would conclude that the cost of a nuclear attack against the United States or its allies or friends would far exceed any expected gain.

- Contributing to deterrence of non-nuclear attacks on, or attempted coercion of, the U.S. or its allies or friends,

- Fostering stability in its several dimensions.

- Maintaining the capability, if deterrence fails, to respond flexibly and effectively to an aggressor's first strike, so as to limit damage to the extent feasible and terminate the conflict on acceptable terms.

- Containing further proliferation of nuclear weapons and advanced delivery systems.

- Negotiating effectively verifiable reductions and restrictions on nuclear forces.

- Maintaining the safety, security, and assured command and control of U.S. nuclear forces.

These objectives for U.S. nuclear weapons are not developed in a vacuum. They, and the policy they represent, are associated with enduring U.S. interests, commonly taken to include:

- The survival of the United States as a free and independent nation, with its fundamental values intact and its institutions and people secure.

- A healthy and growing U.S. economy to ensure opportunity for individual prosperity and resources for national endeavors at home and abroad.

- Healthy, cooperative and politically vigorous relations with allies and friendly nations.

- A stable and secure world where political and economic freedom, human rights and democratic institutions flourish.

Current nuclear weapons guidance was developed during the last decade of the Cold War. New nuclear weapons guidance must, of course, reflect the changes of the new world order.

THE NEW WORLD ORDER

The former USSR - the new Confederation

What formerly was the USSR is transitioning to a post-Soviet future where the political relationships among the constituent, newly sovereign parts are changing almost daily. A Confederation of Independent States has been formed. This Confederation will have some central institutions, the structures and details of which are yet to be defined in any detail. Russia is the largest and most powerful member of the Confederation, and in many ways, the successor of the Soviet Union.

Political leaders in the former USSR continue to grapple with severe internal problems as they maneuver to reorganize the distribution and center of political, economic, and military power. In this process, one of the largest, most heavily armed territories on earth is proceeding toward an uncertain, and perhaps dangerous, future.

The former USSR has experienced a revolution, and history teaches that revolutions are accompanied by strong desires to settle old scores. For centuries, neither the Tsars nor their Soviet successors nurtured a culture which valued and protected the rights of minorities. That is especially worrisome in current circumstances, as ancient nationalist and ethnic rivalries reemerge. Whether the territories of the former USSR will disintegrate into prolonged, brutal internal conflicts like those seen in Yugoslavia, Lebanon, or Northern Ireland is one dangerous outcome that can't be dismissed lightly, especially with the presence of large numbers of modern weapons and trained armed forces in the region.

By any measure, the economy of the former USSR is in free fall as the republics redefine their economic relations with one another, piecemeal reforms are implemented, inflation rises rapidly, production continues to drop, and the winter of 1991-1992 sets in. Even if that process can be arrested and reversed, recovery will be long and painful. If total collapse occurs, chaos will certainly result.

No citizen of the former USSR is left untouched by the trauma and anxiety of the political and economic transitions, nor are the security forces of the region. Well before the failed coup, the Soviet military was under tremendous stress as it withdrew from Central Europe, began to regroup on Soviet soil, and undertook to redefine size, structure, roles, missions, and doctrine. This was complicated by bitter internal debates which blamed the Communist Party and its instruments of power – the military and the KGB -- for the failures of the Soviet system.

Today the future vision of post-Soviet security is more clouded than ever, as political and military leaders restructure the role and institutions of the armed forces in the new confederation. Economic weakness, political choices, and emerging civilian control may lead to a slowing (if not halt) in many weapons modernization programs, and further arms control initiatives may reinforce that trend.

It appears clear that the successor authorities will not disarm to the point that they no longer possess a major military capability (unless they are driven to that outcome by utter lack of resources). They will continue to maintain significant military options for meeting their own security requirements, consistent with their means. Russia (and perhaps other Commonwealth members) will be major military powers.

The future size, structure, posture, and status of the post-Soviet armed forces -- indeed, the fundamental political and social institutions of the post-Soviet societies themselves -- may not stabilize for some time to come. It took the early American states twelve years from independence to produce a constitution, under conditions far more conducive to democratic union than those faced today by the constituent elements of the former Soviet empire.

This uncertain future has led to serious concerns in the West about what will happen to the large Soviet nuclear arsenal. There are about 27,000 nuclear weapons in the former Soviet Union today: about 15,000 associated with strategic offensive and defensive forces, about 9,000 with Soviet ground and tactical air forces, and the remainder with maritime forces. [3]

Most of the strategic nuclear weapons are in Russia, although there are strategic nuclear systems in Ukraine, Belarus, and Kazakhstan. It is unclear whether all tactical nuclear weapons have been concentrated in those four states.

The command and control of these weapons appears to have been fairly secure during the turbulent events leading up to the demise of the Soviet Union, with the possible exception of some older "tactical" weapons. The disposition of the future nuclear arsenal, and the arrangements for command and control of nuclear weapons are issues requiring continued attention, and a good deal of U.S. diplomacy associated with the transition to the successor states has focused on just that question.

President Bush's nuclear proposals announced on 27 September 1991 provided a sound basis for engaging the successor authorities. The American policy initiative to eliminate its worldwide inventory of ground-launched short-range nuclear weapons, remove "tactical" nuclear weapons from warships and submarines in peacetime, and change the alert status of American bombers and a large part of the American ICBM force strengthened the ability of liberal elements in the post-Soviet political debate to press for rapid destruction of excessive Soviet nuclear weapons, especially the older and less secure "tactical" systems.

The President also offered talks aimed at defining areas of cooperation and technical assistance for weapons destruction, physical security and safety, and nuclear command and control. He called for accelerating the START process, and sought to orient the next phase toward eliminating MIRVed ICBMs. And he reemphasized the importance of moving toward missile defenses.

Although initial results of the flurry of diplomatic discussions based upon these and other U.S. initiatives have been positive, it is too early to conclude that all (or even most) problems are resolved. Initial reports from Moscow suggest that destruction simply of the short-range Soviet weapons would cost [illegible] billion and take 10 years to complete.[4] Those figures probably are optimistic.

And the receptiveness to American proposals tends to deflect attention from difficult, longer-

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3. Edward L. Warner III, Statement presented to the Defense Policy Panel of the Committee on Armed Services, U.S. House of Representatives, July 31, 1991.
4. These figures are attributed to Viktor N. Mikhailov, director of defense programs of the Ministry of Atomic Power and Industry, which designs and produces nuclear arms in the former USSR. *The New York Times*, December 18, 1991.

term negotiations on delicate issues like allowing deployment of space-based missile interceptors, retaining MIRVed SLBMs indefinitely, or continuing nuclear testing.

Prior to the failed coup, leaders of republics other than Russia increasingly appeared to opt for non-nuclear status. However, as the Soviet Union disintegrated and the outlines of the successor regimes emerged, the smaller republics also appeared uncomfortable with the prospect of living with a well-armed Russian republic that has a monopoly on Commonwealth nuclear weapons.

The document signed by republic leaders when forming the new Commonwealth stated that members "are striving to liquidate all nuclear armaments, to have total and complete disarmament under strict international control." That is at best a long-term goal, and may have the same relevance to actual policy as do calls by past American Presidents for the eventual elimination of nuclear weapons.

On the vital issue of short-term policy toward nuclear armaments, the Commonwealth accord says that members "will preserve and support common military and strategic space under a common command, including common control over nuclear armaments which will be regulated by special agreement."[5]

A separate accord was later signed by Belarus, Kazakhstan, Russia, and Ukraine, giving additional guidelines (but again with many questions unanswered) as to how nuclear arms would be treated in the new political structure. In that document, Belarus and Ukraine undertook to join the 1968 nuclear non-proliferation treaty as non-nuclear states. Kazakhstan did not associate itself with that undertaking. The nuclear accord is to come into force following ratification in each member state.[6]

What remains to be seen are the critical implementing details of these agreements, and whether those implementing details (and the ambiguously stated commitments they represent) stand the test of time. Even with the best of intentions, the restructuring of the former Soviet nuclear arsenal is a long, dangerous, expensive undertaking, and it can be reversed.

The future of the post-Soviet nuclear weapons complex -- the design, testing, and production infrastructure -- also is unclear. Kazakhstan already had shut down the nuclear test site at Semipalatinsk, and environmental protests are likely to preclude further tests at the Novaya Zemlya test site to the far north. Whether the new authorities could shift to alternate test sites, even if they wanted to, is unclear. These considerations figure heavily in their continued call for a nuclear testing moratorium.

The nuclear weapons complex and infrastructure of the former USSR clearly are not insulated from the economic and political changes which are sweeping through the remainder of the society, and indeed may be under greater pressure than many other elements of the eroding military-industrial complex.

Even in conditions short of civil war, a disintegrating nuclear power could add to global proliferation problems if its scientists and engineers, perhaps armed with blueprints or small components such as advanced missile guidance systems or nuclear weapon subcomponents, abandon their homeland to seek work for Third World leaders intent on building their militaries for aggression.

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[5] Article 6 of the Accord on Commonwealth of Independent States. Text of the full accord can be found in the *New York Times*, December 10, 1991.

[6] Accord on Nuclear Arms. Text of the full accord can be found in the *New York Times*, December 23, 1991.

Long before the coup, Professor Michael Howard put the sweeping changes in perspective in when he wrote: "[W]hatever happens, the Soviet Union will remain a major power whose military strength and political culture will continue to present major difficulties to the West. We must look for evolution rather than transformation, and not expect too much too soon."[7]

Someday the United States may have a peaceful, broadly cooperative relationship with the successor powers on the territory of the former Soviet Union not unlike its relationship with other former adversaries. Perhaps one day the successor authorities will be like the French: a proud, difficult nation (or nations) seeped in history; a victim of recent invasion, now armed with nuclear weapons targeted nowhere in particular but available as an ultimate deterrent.

Until that world emerges, however, it should be recognized that the successor authorities in the former USSR are not our Cold War enemies, but have a long way to go in achieving a a stable political structure in which democratic institutions will not be easily overturned. Even leading liberal political figures in the former USSR caution that democratic trends can be reversed if economic reform does not succeed.[8]

The residual military structure in the successor states (at least in Russia) has nuclear forces which are capable of destroying the United States in a single, devastating blow, and which could be used to underwrite coercive diplomacy or to settle old scores. Currently it is fashionable to dismiss this capability as no threat to the U.S. because of favorable political trends in the former USSR, and the absorption of political and military authorities with their internal problems.

While it is bizarre to envision circumstances in the near term in which political authorities in the former USSR would threaten the U.S. with nuclear weapons, the mediate or longer future may change that assessment – much as the dramatic events of the past two years turned all the old assumptions about the USSR upside down.

Prudence dictates that while the U.S. should take advantage of unprecedented opportunities to reshape the nuclear balance, it also should not dismantle its arsenal precipitously while a significant arsenal remains on the other side. There are options for changing nuclear postures (alert rates, deployment patterns) in positive directions quickly, and these are being pursued. Changing the fundamental nuclear balance should proceed more deliberately, however.

The successor authorities in the former USSR also have large conventional forces. Although the readiness of these forces is eroding, they still, if convinced of the rectitude of their orders, are capable of engaging in short notice conflicts along contiguous borders, and among (or within) republics.

There is the remote, future possibility of a reconstituted, centrally-controlled power projection posture hostile to Western interests. There remains the chance that the post-Soviet military establishment could achieve technological breakthroughs threatening to American military power. And there is the more immediate danger that internal stresses still could deteriorate into wider civil conflict and could accelerate the proliferation of deadly weapons and technologies to the Third World.

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[7] Michael Howard, *Lessons of History* (1991), pp. 4-5

[8] See, for instance, chapter eleven of Anatoly Sobchak's *For A New Russia* (1991).

Thus, while hoping for the best, it should be recognized that the current relationship with the former USSR is fragile and could again suddenly change.

Eduard Shevardnadze concluded his brief resignation speech in late 1990 with the statement: "I believe that the dictatorship will not succeed, that the future belongs to democracy and freedom."

Mikhail Gorbachev said in his resignation speech one year later: "I think it is vitally important to preserve the democratic achievements of the last years. They have been paid for by the suffering of our whole history, our tragic experience. They must not be given up under any circumstances or any pretext, otherwise all our hopes for the better will be buried."

We applaud those sentiments, and believe that the U.S. nuclear posture should be managed to support and help nurture the development of democracy and freedom in the former USSR by adjusting to the realities of the current situation. However, it also must be managed to provide insurance in the event that the post-Soviet experiment in democracy and freedom fails. That is an important theme which must not be ignored as Americans contemplate the role of nuclear weapons in the new world order.

Europe, Canada, and Japan

Western Europe is likely to be increasingly prosperous and moderately integrated. However, no single European nation exercises clear leadership, and in many respects that is not desirable. In the absence of a clear leader, it is extraordinarily difficult (if not impossible) for Europe to develop a common foreign and security policy. One of the first tests of a common European approach to resolving security problems has been the crisis in Yugoslavia, and the results thus far are not encouraging as ceasefires continue to break down and Yugoslavia slides into a bloody civil war.

The former members of the Warsaw Pact almost certainly will take a long time, probably at least a generation, to recover from decades of inept rule and damage to their economies and environments. Security arrangements for these countries are in flux.

NATO still plays a major, yet not fully defined, role in the new European security equation. U.S. policy is to keep NATO the centerpiece of European security. The U.S. seeks to remain engaged with Europe and the Atlantic Community largely through NATO, but also through U.S. relations -- direct or indirect -- with other institutions such as the European Community (EC), the Western European Union (WEU), the Conference on Security and Cooperation in Europe (CSCE), and the Council of Europe, as well as through bilateral relations with individual European states and with Canada.

This remains a sound strategy, even after Maastricht. It is in America's interest to help design the security institutions of the new era in Europe, and to take a leading part in clarifying the role of nuclear weapons for European security.

Prior to the failure of the Soviet coup, the Conventional Armed Forces in Europe (CFE) agreement was [illegible] by NATO as the keystone for a stable and lasting peace on the European continent. CFE remains an important element of the emerging Atlantic security structure. Arms control and confidence-building measures will continue to be [illegible] means of shaping and consolidating the modern order in Europe. Preparations have been underway for new negotiations on conventional arms, open to all CSCE members, after the Helsinki CSCE Follow-Up Meeting in early 1992.

There also had been calls for prompt resumption of Open Skies negotiations, and earlier had been calls for (and [illegible] degree of commitment on) negotiations on Short Range Nuclear Forces (SNF) -- nuclear forces with ranges less than the 500 kilometers which was the demarcation point of the Intermediate Nuclear Force (INF) treaty.

Open Skies is proceeding on [illegible] promising track, and the prospect of chaos in the former USSR reinforced the SNF debate. President Bush's decision to eliminate American ground-based SNF systems globally, his call on the Soviets to do likewise, and their generally favorable response may resolve this problem.

All evidence currently suggests that France and Britain will retain modest nuclear arsenals on the order of several hundred to perhaps a thousand nuclear weapons apiece, based largely on submarines and strike aircraft. The special American relationship with Britain, reflected in the U.S.-UK Program of Cooperation for British nuclear forces, remains [illegible] important element of U.S. security policy. The British nuclear force will be heavily dependent on American support for the foreseeable future. Both French and British nuclear modernization programs [illegible] being subjected to [illegible] fiscal constraints. The French Hades nuclear missile program may be the last ground-launched nuclear system in Central Europe, and the future of that program is unclear.

Germany and Japan [illegible] global economic powers, controlling close to a quarter of the world's wealth. However, they are unlikely to achieve the internal consensus or undertake the commitment of resources to their militaries necessary to become other than economic powers, even where they are permitted to do so by international agreements and their own constitutions and implementing laws.

The divisive internal debates in Germany and Japan on the role they should have played in the Gulf War suggest the difficulties these two nations would have in the next decade in aspiring to superpower status. Germany has begun playing an increasingly assertive role in European politics. Japan, on the other hand, has responded slowly to events like the attempted coup in the USSR, and appears to lack [illegible] clear, systematic vision of what Japan's role should be in the new world order.

It is in the U.S. interest to nurture [illegible] environment in which Germany and Japan are secure members of the global community, maintain reasonable defense efforts, tend to align themselves with the United States [illegible] the most fundamental questions of security, and do not feel compelled to acquire independent nuclear arsenals.

This will not be easy. The U.S. will find its interests at odds with those of Germany and Japan on [illegible] number of important issue, especially in economic and trade matters. U.S. ability to creatively manage those differences will be [illegible] important factor defining the long-term direction of emerging global power.

The Third World

The remainder of the world is loosely defined as belonging to the Third World -- a grouping of over 120 highly diverse states, at different stages of economic and industrial development, caught up in a number of destabilizing and increasingly lethal regional disputes.

The Third World is the scene of almost continuous violence at varying levels of intensity. It is divided into regions where long standing animosities, simmering resentment toward the wealthier parts of the global community, personal ambitions of autocratic rulers, and the chronic absence of domestic constraints on aggressive behavior frequently erupt into violent conflicts. The proliferation of advanced weapons to Third World militaries adds to the powder-keg atmosphere that permeates regional differences in much of the globe.

American armed forces have engaged in combat in the Third World on a number of occasions during the nuclear age. Most recently, in the Gulf War, the U.S.-led coalition faced an Iraqi army which on the eve of Desert Storm was assessed to be second only to Israel in the Middle East in terms of military capability. The coalition adopted a military strategy designed to exploit superior planning, training, doctrine, and technology to achieve tactical and strategic surprise. This strategy worked, resulting in one of the most lopsided victories in history. It also ushered in a new age of technological warfare which suggests some of the potential for non-nuclear strategic weapons.

In the interim report to Congress on the conduct of the Persian Gulf conflict, the Defense Department acknowledged that it does not understand the reasoning underlying many of Saddam Hussein's strategic decisions. One of the most critical uncertainties is why Saddam Hussein did not use chemical warheads on modified Scud missiles to attack Israel and Saudi Arabia. The deterrent role of nuclear power -- Israeli and American -- cannot be discounted as factors bearing upon Saddam Hussein's decision.

Israel's lightly veiled threat to respond to Iraqi chemical attacks with nuclear retaliation probably was well understood by Saddam Hussein, and the United States maintained a deliberate ambiguity on the question of whether it would use nuclear weapons in response to Iraqi chemical attacks. However, there are other reasons which may have entered Saddam's decisions, including the presence in the region of active and passive defenses which could be expected to dampen the effects of chemical weapons, the coalition's absolute control of airspace which prevented Saddam Hussein from using aircraft to deliver those weapons, and the uncertain reliability of chemical warheads on Iraq's modified Scud missiles.

The events of the Gulf war, subsequent revelations about Iraq's nuclear programs, and the uncooperative approach of Saddam Hussein's government reinforce concerns about the spread of advanced delivery systems and mass-destruction weapons into unstable Third World regions. The fact that Saddam Hussein's very sizable nuclear program reached the point it did, and that large segments of the Iraqi people still can be mobilized in support of Saddam Hussein's actions with respect to that program, suggest that joining the nuclear club will be popular where affordable.

In South Africa and Latin America, actions and policies addressing proliferation, combined with domestic trends in the region, appear to be yielding positive results. On the Korean peninsula and in the regional arc extending from North Africa through the Middle East to South Asia, the prospects of successfully dealing with proliferation are decidedly more uncertain.

The presence of more lethal missile arsenals in the Third World in the next decade is another problem facing U.S. defense planners. As longer-range, more accurate, and perhaps more lethal missiles enter Third World inventories despite efforts to prevent this proliferation, the scope and extent of regional conflicts will expand, and the conditions under which the United States and other states can enter such conflicts also will vary. If Saddam Hussein had possessed nuclear-armed ballistic missiles capable of striking Tel Aviv and the cities of many of our coalition partners, the decisions to resist Iraqi aggression would have been much more difficult -- and perhaps impossible -- for a number of political leaders.

Two Third World nations, China and India, contain within their borders one third of the world's population alive today, a proportion that may increase slightly through at least the early decades of the next century.

Although U.S. interests often are at odds with Chinese and Indian policies, neither China nor India poses a major, immediate danger to U.S. security today. However, China is a wild card for other reasons.

China has a nuclear arsenal that continues to grow and which is capable of striking the U.S. and its friends and allies. Command and control of that arsenal have been problematic. China's aging hardline leadership is increasingly isolated. We cannot rule out a period of prolonged instability in China during a leadership succession struggle, nor can we rule out a future in which China adopts newly aggressive policies, especially with respect to outstanding problems like Taiwan. Chinese leaders also worry about the future of a rearmed Japan, especially if that involved a Japanese nuclear option.

Moreover, China and India -- who last fought in 1962 -- have unresolved border claims against one another. India's unresolved problems with Pakistan could again erupt in conflict, which is especially dangerous given the prospects that India and Pakistan may use nuclear weapons against one another in the future, and with the proximity of China to the conflict.

China, India, and Pakistan all have active, expanding ballistic missile programs. China's program is one of the oldest and most sophisticated in the Third World, and since the 1980's, China has become a major exporter of ballistic missiles, including long-range systems like the CSS-2 which it sold to Saudi Arabia in 1988.

China has appeared to be ready to sell to even the most despotic Third World powers. India and Pakistan seem to be pursuing their ballistic missile programs for deterrent purposes and for use in the region if war breaks out. Other Third World nations – e.g., North Korea, Brazil, and Argentina -- have domestic missiles industries. North Korea has been actively involved in an accelerating, destabilizing missile export program, and in a domestic nuclear weapons program of considerable intensity.

The Middle East is one of the most highly unstable zones on the globe. Current diplomatic efforts to address the root causes of crises in that area are proceeding vigorously. Whether these latest attempts to deal with one of the old world order's most intransigent problems, the Arab-Israeli conflict, will succeed in the new world order is highly uncertain. And other parts of the Third World, especially the Korean peninsula, remain very dangerous regions.

Thus it is clear that the threats to U.S. interests in the Third World are diverse, ranging from terrorism to nuclear-armed ICBMs. While it is unlikely that the United States will use nuclear weapons in such regional conflicts, it is in the U.S. interest to maintain a deliberate ambiguity when facing aggressors like Saddam Hussein who are armed with weapons of mass destruction. How to do this, while also encouraging non-proliferation of nuclear weapons, will be discussed more fully later in this report. Also as will be discussed later, it is not clear that the United States can count on deterrence to deal with many lethal Third World threats.

Other relevant factors

The emerging global security environment has other dimensions. Non-state groups (e.g., various terrorist associations or organized drug cartels) are important sources of tension. Large industrial enterprises are acquiring an increasingly transnational character which, among other things, complicates attempts to stem the proliferation of advanced military technologies into the global market. The unfolding BCCI network illustrates the trend of diffuse, often hidden transnational institutions.

Modern telecommunications provide instant public access to developing crises, and affect the atmosphere in which governments can deliberate and act. They also reinforce public awareness of environmental problems, which are high on almost all national agendas.

Nuclear weapons have a special mystique, and public attitudes toward things nuclear -- currently relatively quiescent -- are subject to sudden, highly emotional change. A single nuclear incident or accident could have broad repercussions. As one observer commented, anybody's accident is everybody's problem. Whatever nuclear posture the U.S. adopts for the new world order, it must be secure, safe, and environmentally acceptable.

An emphasis on safety brought about the removal of SRAM-A missiles from bombers formerly on alert and changed the weapons loading procedures for Trident D-5 missiles. These are short term fixes; inherently safe and secure weapons should be the long term objective. However, as will be discussed more fully later in the study, problems within the DOE nuclear weapons complex make it virtually impossible in the near term to fabricate safer weapons components although the technology and designs are in hand.

Historically, arms control negotiations have focused mostly on the East-West confrontation. In 1991, prior to the Soviet coup attempt, it appeared that priorities would shift toward dealing with proliferation problems. Now arms control and other initiatives dealing with the uncertain future of the Soviet nuclear arsenal again appear to be at the forefront of the American agenda.

East-West arms control efforts broadly defined -- formal arms control, talks on technical cooperation, parallel unilateral actions and the like -- will not end. One immediate topic must be modifying the ABM Treaty to permit some degree of limited ballistic missile defenses beyond the treaty's current limits. Another must be negotiating further reductions and constraints on strategic nuclear forces. As time goes on, arms control initiatives dealing with proliferation (in conjunction with other nonproliferation tools like export control) hopefully will gain ground.

Arms control in all areas is likely to become a more routine, less visible part of the security agenda. Arms control should continue to be one element of national security policy, recognizing that the U.S. cannot depend on arms control to solve all problems. Indeed, [illegible] strong argument can be made that arms control succeeds when accompanied by sound force postures and credible sanctions for unacceptable behavior.

That said, arms control efforts should concentrate on refining and expanding the agreements already reached (nuclear testing, INF, CFE, START), while extending -- and in some cases creating -- more effective non-proliferation regimes.

Finally, it is worth recalling that technology continues to generate new military options. The recent lopsided victory in the Gulf War, resulting in part from the fusion of modern technologies (sensors, stealth, C3I, standoff precision munitions) with effective planning, increases the incentives of states to identify and pursue new technologies for military purposes.

The U.S. role in the new world order

This brief survey of some highlights of the new world order suggests the sort of diffuse, multifaceted world facing the U.S. in coming years.

America is the only modern state which derives its influence from a broad base of military, economic, and cultural power. As such, America exercises a unique leadership role that cannot be assumed by any other single nation for the foreseeable future. The socioeconomic dimensions of power [illegible] likely to increase in importance in future years, and the United States -- the largest debtor nation in the world -- clearly is losing its economic edge. However, [illegible] the recent Gulf conflict demonstrated, the military dimension retains vital significance.

The U.S. has sought to engage with its allies and others to form action-oriented coalitions where circumstances and opportunities permit, in pursuit of mutual security interests. This will likely continue to be the pattern of American action abroad. Such engagement requires different types of American influence. The role that American nuclear weapons can play in underwriting and reinforcing American influence (or, in some circumstances, in not undercutting that influence) is hard to describe in the abstract, but will remain [illegible] factor in the coalition activities which characterize the new world order.

There also [illegible] self-imposed constraints on American security activities. The American public does not want to pay for more than [illegible] believes to be necessary, and in the aftermath of the Cold War, there [illegible] strong, newly vocal sentiments that the defense budget should drop sharply and quickly, and that America's allies and friends must assume an even greater share of common defense burdens. Military programs that are visibly expensive and/or pose high risks to the environment or health will be notably affected by grassroots opposition.

In this milieu, [illegible] will be more difficult than ever to build and sustain consensus for modernization of highly visible nuclear forces, despite the fact that strategic deterrence remains the intellectual cornerstone of national defense. There will be [illegible] strong public tendency to accept arguments that less is enough, except where compelling rationales or real world crises argue to the contrary. A clear conception of the role of nuclear weapons in the new world order should guide modernization and sizing of American nuclear forces

U.S. nuclear weapons in the new world order

Historically, nations have acquired nuclear weapons for a variety of reasons. When one studies the history of the nuclear age and attempts to reconstruct the national motivations underlying nuclear weapons programs, a variety reasons emerge for why nations seek to acquire nuclear weapons. Those reasons include:

- To coerce, destroy, terrorize, or blackmail other nations.

- To deter others, especially adversaries with nuclear weapons or vastly superior conventional forces. Moreover, a Third World nation may believe (with some justification) that even a small nuclear arsenal helps to deter the major powers from intervening in what it defines to be its regional affairs, or otherwise influences superpower behavior.

- To use nuclear weapons to achieve political or military goals, if deterrence fails.

- For the vague (but still powerful) concept of influence, power, and status.

- And more recently, "because they are there for the taking" by breakaway centers of power (republics, military units) or by revolutionaries or terrorists.

Today the United States has nuclear weapons to help protect its abiding interests. Nothing in the new world order has changed those interests. The survival of the United States as a free and independent nation with its fundamental values intact and its institutions and people secure continues to be an elementary goal, as are the related abiding interests described earlier:

- A healthy and growing economy to ensure opportunity for individual prosperity and resources for national endeavors at home and abroad.

- Healthy, cooperative, and politically vigorous relations with allies and friends.

- A stable and secure world where political and economic freedom, human rights, and democratic institutions flourish.

We conclude -- based upon what follows in this report -- that in a world where others have nuclear weapons and other highly lethal military instruments, the United States must retain nuclear weapons as one means of pursuing its most fundamental purposes.

America must maintain a modern, safe, secure, environmentally responsible nuclear weapons capability to: (a) deter aggression, especially but not solely by other nuclear weapons states, if such aggression threatens U.S. survival; and (b) extend that nuclear deterrent, in varying degrees, to allies and friends.

The U.S. also must seek not merely to deter attack on powerful allies and friends, but where possible, to dissuade them from seeking nuclear weapons of their own. And the U.S. must not be in a position of pronounced vulnerability to coercion by others, in ways which preclude healthy pursuit of its fundamental goals.

DETERRENCE THEORY AND ITS COROLLARIES

Deterrence

Deterrence is prevention of an action by the fear of its consequences -- a state of affairs brought about when rational individuals in positions of authority are persuaded there is a credible prospect of devastating retaliation far outweighing anything they conceivably could gain if they initiate a specific action.

Rational behavior never has been defined to the satisfaction of deterrence theorists. The general model, borrowed from the social sciences, is cost-benefit maximizing behavior. However, even during the Cold War, this model debatably was inadequate for capturing the complex political environments during crises, and for accounting for the emotions, values, ambitions, and other considerations affecting participants. In the post-Cold-War world, where the deterrence of Third World conflict takes on new emphasis, understanding rational behavior is even more problematic, and the standards of rationality clearly are more complex than before.

This abstract concept of deterrence, especially in its military setting, preceded the nuclear age. Historically, wherever two adversaries confronted one another with the threat of war, political authorities calculated their chances of achieving their war aims. There are numerous instances of *deterrence by denial*, that is to say, preventing a military operation or a war by convincing the opposing side it cannot achieve its goals if it attacks. There also are instances of *deterrence by punishment*, i.e., preventing a military operation or war by credibly threatening that such action would trigger effective retaliation against something the opposing authorities seriously value.

Where non-nuclear states face one another, there always is the hope, even for a party facing vastly superior forces, that success might be achieved because of luck, some new technology or tactic, or the pure skill of a commander. Where the cost of deterrence failing is not immediate, ruinous, or overwhelming, there is a greater chance for miscalculation, self-delusion, and simply stupid behavior. This is why purely conventional deterrence can fail and frequently has.

On the other hand, nuclear weapons narrow the chances that deterrence will fail. It is difficult for leaders facing the serious prospect of a nuclear response to calculate that they can absorb that attack and go on to achieve their war aims. If targets deep in the homeland are at risk to retaliatory nuclear strikes, it is likely that the most fundamental values of the society also are threatened.

Thus, the pronounced difference for deterrence theory in the nuclear age is the direct cost associated with aggression on a massive scale. This is true whenever nuclear weapons are in the background of a crisis, and especially relevant when large nuclear arsenals of intercontinental range are involved and may be used.

This does not mean that deterrence cannot fail in today's world. For deterrence to succeed, there must be a perceived capability to inflict unacceptable costs, sufficient credibility, some estimate that the threat won't be executed if certain actions are not taken, and a degree of control over one's own forces.

Deterrence can fail due to irrational behavior, insufficient capability and credibility, excessive provocation, miscalculation, accident, unauthorized behavior, or poor communications.

In the old world order, the U.S.-Soviet deterrent relationship was the centerpiece of American defense planning. Over time, that relationship evolved to a point where subtle communications were better understood, thresholds were recognized and respected, and provocative behavior was minimized if not avoided.

Whether those same conditions will obtain with the new nuclear authorities is unclear. A fractured Soviet Union in which several sovereign states possess nuclear weapons, or in which they cooperate in some loose fashion in controlling a central nuclear force, creates situations where the old rules and principles may change.

In the new world order, the danger that deterrence might fail also will be greater as nuclear, chemical, and biological weapons proliferate along with advanced delivery systems to Third World nations where failure modes aren't as well defined. When dealing with the Third World, the U.S. often finds that thresholds are vaguely defined, communications are more ambiguous, and fundamental values and political structures are less well understood.

To put it bluntly, there will be many instances in which the U.S. simply won't understand what will deter a Third World leader. As complicated as the Cold War appears in retrospect, it was a much less complicated environment than the one America is entering. Deterrence in the Third World is an area requiring continual study, and its uncertain status is a compelling reason for giving more attention to theater missile defenses.

Reassurance

What sometimes is called extended deterrence is a form of *positive reassurance*. A "nuclear umbrella" is extended to allies or friends by communicating that an attack on them will be treated as an attack on oneself. In the nuclear age, positive reassurance is associated with the goal of containing the proliferation of nuclear weapons.

Thus, in theory an American nuclear deterrent extended to its non-nuclear-capable NATO allies, to Japan, to South Korea, and so forth, at least partially offsets internal pressures which might otherwise build in those nations to acquire nuclear arsenals of their own. However, there is no guarantee that extended deterrence works in preventing proliferation, as the cases of France and Israel demonstrate.

Enhancing credibility that American strategic nuclear forces would be used in defense of allies and selected friends has been a major concern of American leaders, and the strategic concept in which American forces (including some theater nuclear element) are deployed forward in peacetime, and can be rapidly expanded in crises, is one of the intellectual underpinnings of extended deterrence.

There also are *negative reassurances* associated with America's nuclear non-proliferation goals. In 1978, in connection with the UN Special Session on Disarmament, the U.S. Secretary of State issued a policy statement that the U.S. would not use nuclear weapons against any non-nuclear weapons state party to the Nuclear Non-Proliferation Treaty or to any comparable internationally binding commitment not to acquire nuclear explosive devices, except in the case of an attack on the United States, its territories or armed forces, or its allies, by such a state allied to a nuclear weapons state, or associated with a nuclear weapons state in carrying out or sustaining the attack. This guarantee has been reaffirmed by subsequent American administrations.

For some leaders like Saddam Hussein (who are prepared to agree to, but not comply with, prohibitions on acquiring nuclear weapons), negative reassurances are meaningless. Those leaders will pursue programs and policies which threaten U.S. interests regardless of America's public policy on nuclear weapons use against them.

In cases of clear aggression which threaten fundamental U.S. interests, especially where weapons of mass destruction or other highly lethal weapons are involved, the United States should retain an option to leave ambiguous whether it would employ nuclear weapons in retaliation to gross acts on the part of an aggressor. This is not inconsistent with a modified policy of negative reassurances which emphasizes the fact that in all cases, nuclear weapons are instruments of last resort, but that aggressors involved in blatant and clear transgressions do not have sanctuary from whatever force is deemed necessary and appropriate for countering their aggressions.

Coercion, dissuasion, influence, and insurance

Coercion -- forcing action by intimidation and the direct threat of force -- shares the same form of argument as deterrence in state relations, with reversed logic. Deterrence connotes attempts to prevent a state from initiating a well defined action it otherwise wants to undertake. Coercion connotes forcing a state to do things it otherwise doesn't want to do.

Threatening to use force -- threats backed by credible capabilities and associated actions -- is an ancient element of statecraft. Coercion is a tool employed both by despotic and democratic states. In the nuclear age, the coercive potential of nuclear weapons has been explored by scholars at great length, resulting in considerable disagreement as to when nuclear coercion has or has not taken place, and whether it can work.

In the Cuban missile crisis of 1962, for instance, most would agree that the United States coerced the Soviets into removing missiles from Cuba. It appears likely that U.S. nuclear weapons played a role in America's success in that crisis, but experts still disagree on how significant that role was and what most compelled the Soviets to settle the crisis largely on U.S. terms.

Dissuasion -- the discouragement of certain actions -- also has been associated with nuclear weapons. Part of that association is related to extended deterrence, discussed earlier. Germany has been dissuaded from pursuing nuclear weapons in part by the American extended deterrent. Some have argued that a new role for dissuasion would be discouraging a future government in the former USSR from rebuilding a military establishment postured for power projection.

Influence is a milder form of coercion, without the overtones of direct intimidation and well-defined threat, and perhaps without deliberate effort. It is clear that a state achieves some kind of influence if it acquires nuclear weapons. Describing that influence and isolating the relevance of nuclear weapons to specific policies and outcomes, especially outcomes other than deterrence of major conflict, is difficult and often disputed.

Some argue that a few hundred (or even a few dozen) nuclear weapons are enough for status and deterrence. Some argue that nuclear weapons create ■ situation called "existential deterrence," and that the characteristics or plans for use of the nuclear weapons are largely irrelevant to deterrence -- that the simple existence of ■ few nuclear weapons is ■ form of limited but ultimate insurance, protecting ■ a state from coercion or destruction in extreme situations.

This study does not point to that conclusion. The numbers, composition, posture, doctrine, deployment and intended employment of nuclear weapons are important factors and should not be left to chance.

War prevention, preemption, and unilateral surrender

Should deterrence remain the cornerstone of U.S. security policy in the future, or should the policy be recast in terms of the wider concept of war prevention? You can prevent war by deterrence. You also can prevent war by fostering cooperative relations which reduce the causes of tension, and can prevent (or at least delay certain forms of) war by preemptive strikes.

Finally, it can be noted in the abstract that war can be prevented by unilateral surrender. Unilateral surrender clearly is not part of the American tradition; however, some conclude that unwise actions -- e.g., irresponsible appeasement, or unilateral disarmament at a time when the enemy is arming and/or unwilling to reciprocate -- have the much the same effect as ■ policy of unilateral surrender.

Israel's attack on Iraq's Osirik nuclear reactor in the early 1980's is an image of preemption that may be revisited in the future, for other dangerous situations. The development of new high-precision, non-nuclear weapons increases the options for preemptive strikes which are discriminating and minimize civilian casualties. However, it must be noted that the American tradition is strongly opposed to preemption, and preemptive options will be entertained seriously only in extreme circumstances.

Deterrence should remain the organizing concept for U.S. military doctrine, supplemented where necessary by robust doctrines and adequate capabilities for defense and employment if deterrence fails, and well-thought-through options for preemption in very unlikely proliferant situations.

Stability

There is general consensus that nuclear forces should be designed and postured to foster stability. Stability has taken on ■ number of meanings over the years, including:

- *Crisis stability*, sometimes called first strike stability, which is ■ condition in which neither side in ■ nuclear confrontation believes it can gain significant advantage by striking first, and both sides believe they can delay an immediate, panic-driven response, confident that they will have sufficient surviving forces and related C3I to retaliate with punishing counterattacks.

Crisis stability remains an important objective. However, the above description of crisis stability applies primarily to the bipolar nuclear relationship of the Cold War. We need to think through what ■ wider conception of crisis stability should entail in the new world order. Some believe, for instance, that non-nuclear strategic weapons will allow the President to manage crises below the nuclear threshold, while simultaneously making the threat of escalating to the nuclear threshold more credible for some future contingencies. How to manage crises in instances where the U.S. is uncertain about the nuclear status of regional powers may also be an aspect of crisis stability in the emerging environment.

- *Arms race stability*, which exists when incentives and pressures are low to react to changes in the adversary's military posture with costly new programs. Arms race stability is a complex concept, however, because the international competition proceeds on many fronts: arms inventories, technology, economic strength, and national will among them. There are many who believe the U.S. won the Cold War because the Soviet system couldn't stay in the game. Their attempts to do so, devoting 15-20% of their GNP to the "arms race," broke the back of their system, creating the conditions which brought new leadership to the fore.

Thus, while recognizing that arms race stability is a worthwhile objective, it must also be understood in the broader context of other objectives.

- *Political stability* exists when hostile relations give way to cooperative endeavors. Adversaries seek to identify and expand areas of mutual interest and benefit rather than areas of unilateral advantage, and the competition is steered away from military confrontation.

While political stability is a useful goal, it also can be a volatile, sometimes superficial condition. The semblance of normal relations may conceal underlying tensions which can erupt with little warning.

Parity and further reductions

At a minimum, the U.S. must retain rough parity with the large, post-Soviet nuclear posture. This does not require matching it in every detail, but means ensuring that in an overall sense, parity (sometimes also called essential equivalence) is commonly seen to exist.

If parity is not maintained, the apparent imbalance could undercut the public mood on security, erode our allies' confidence in extended deterrence, and undermine stability. The size of the nuclear arsenals of other nations also is a factor in sizing the U.S. nuclear posture. If the American arsenal shrinks to the size of the arsenals of virtually all other states, it is doubtful that Germany and Japan can over time resist the pressures to acquire similar capabilities.

If, and as, other nations reduce their nuclear forces, in a manner which reinforces confidence that the reductions are neither shams nor readily reversible, American nuclear forces can draw down further in size.

Also, if the post-Soviet nuclear posture reduces to levels of today's smaller nuclear powers, other dynamics argue against U.S. nuclear forces reducing to the same size -- dynamics involving the goal of keeping future major powers like Germany or Japan from believing they too should acquire nuclear weapons.

Accidental war

Another important idea often associated with stability is the importance of avoiding nuclear war by miscalculation or unauthorized or accidental actions. With the possibility of chaos in the former USSR, and as nuclear weapons and advanced delivery systems proliferate, this is a growing concern.

The U.S. seeks to contain, and if possible reverse, the proliferation of nuclear weapons and advanced delivery systems. The U.S. also has an interest in encouraging others to develop secure nuclear control systems. These are not new policy goals; however they must receive renewed attention in light of recent events.

Hopefully, the President's initiative to engage the successor authorities in the former USSR in technical discussions on nuclear safety and security will provide mechanisms and precedents for similar discussions with other nations, e.g., the Chinese.

Defenses

If proliferation cannot be contained, if nations with nuclear weapons do not have secure control over those weapons, and if the chances of accidental launches increase, the importance of defenses will grow.

Ballistic missile defenses are receiving fresh emphasis in U.S. security planning. The recent experience in the Gulf War is the immediate catalyst for much of the renewed interest. For the first time since 1975 (when Congress voted to deactivate the U.S. missile defense system in North Dakota), a consensus is forming on Capitol Hill that the U.S. should deploy some sort of limited ballistic missile defense. The deployment of U.S. Patriot missiles to the Gulf also suggested a future pattern in which the U.S. may extend a ballistic missile defense umbrella to allies and friends. This may help preclude some of those states from feeling driven to acquire or expand their own ballistic missile forces.

The focus is on limited threats and on theater contingencies, not on ■ massive missile attack of the U.S. homeland. The form of the defenses (especially whether they would include interceptors based in space), and whether the post-Soviet authorities would agree to modify the ABM Treaty, are major unknowns at this time.

One point worth noting is that for military planners in the former USSR, "strategic" ballistic missile defenses and "theater" ballistic missile defenses increasingly will mean the same thing. Whatever buffers may have existed previously are gone, as Soviet armed forces withdrew to their own territory. Thus, even if the ABM Treaty is modified primarily to sanction robust development of theater missile defenses, this has an impact on the successors to Soviet strategic defenses and thus on U.S. offense force requirements.

Attention also needs to be paid to defense of U.S. forces abroad (and of U.S. friends and allies) against advanced air-breathing threats, including threats incorporating stealthy stand-off weapons. Also, protecting the U.S. against covert, unconventional nuclear threats should not be ignored.

Thus, in all its dimensions, the offense-defense relation requires ■ fresh look.

Damage limitation, escalation control, and war termination

At various times during the nuclear age, strategists have explored the question of whether damage to the United States and perhaps to its allies and friends could be limited by a massive strike against the enemy's nuclear forces at the start of a nuclear exchange.

As nuclear arsenals grew larger, most observers agreed that the prospect of any significant damage limitation was simply nonexistent. However, the U.S. continued to target enemy nuclear forces, often with fast-flying ICBMs carrying hard-target-kill weapons.

Much of the targeting was against fixed installations, including ICBM silos. This led to an apparent dilemma. On the one hand, a weapon arriving on an an enemy's ICBM silo after the initial strike on U.S. forces might well destroy no more than an empty silo. On the other hand, a large retaliatory attack against over 1,000 enemy silos would remove whatever incentives, if any, there were for enemy leaders not to execute all their ICBMs in the first phase of an attack -- "use them or lose them," as it was phrased. Many questioned targeting silos.

Nobody knows what the aftermath of a massive nuclear war will be. Few responsible leaders doubt that it would be devastating, and many have expressed the sentiment that it could mean the end of civilization. However, for the person with the authority to respond to a nuclear attack on the United States, its forces, or its friends or allies, the occasion is not an emotionless exercise in cost-benefit analysis.

In a rapidly unfolding nuclear crisis fraught with the inevitable confusion that surrounds such apocalyptic occasions, the final option (after a massive first nuclear strike) may be to save whatever can be saved, despite the reality that enormous numbers will die and suffer, and that the very survival of society is problematic.

This is the rationale for the National Command Authority (a shorthand for the President or, in the President's absence, the designated successor with the authority to order nuclear attacks) having options, however slim the chances, which might save American and allied lives if nuclear war occurs, despite all efforts to prevent it, and for terminating the conflict on the best terms available. The issue of attacking the nuclear weapons installations of a major nuclear aggressor, and especially ICBM silos, is associated with this train of thought.

It is likely that not all enemy ICBMs would launch immediately, even in a massive first strike. Some missiles would suffer failures such as guidance computer problems, and have to be repaired. Others might not receive the initial execution commands, and some launch control officers may elect not to carry out orders. These are situations that can be corrected relatively quickly, but probably not before an American ballistic missile can reach enemy soil.

With the accuracy and yield of modern ballistic missile weapons in the U.S. inventory , placing a weapon on an ICBM silo offers high confidence that the silo would be destroyed. Moreover, attacking enemy silos prevent them from being reused with new, reloaded missiles -- a capability designed into and tested by Soviet strategic rocket forces in the past.

Attempting to think this problem through involves one in considerations of what it means to attempt to terminate a nuclear exchange. Should it be terminated quickly or slowly? Common sense suggests responding to a limited attack with a limited response, hoping that in the heat and confusion of combat reason will prevail and the aggressor will be shocked into realizing that nothing can be gained by further nuclear exchanges. That is the essence of escalation control.

Having the capability to attack an enemy nuclear installation like ■ silo, and opting to use that capability, are two different things. As the U.S. early warning and attack characterization systems improved, it became possible to envision situations in which the National Command Authority could distinguish between a nuclear attack which is major and in which ■ large proportion of the enemy's ICBMs have been launched, and a limited attack involving few if any ICBMs. In the case of the major attack, escalation control recedes in importance. In the case of ■ limited attack, escalation control gains in importance.

This calculus, never clear during the Cold War, is murkier in the new world order. These considerations are taken into account later in the study, in examining doctrine for the use of nuclear weapons if deterrence fails.

NUCLEAR STRATEGY, FORCES, AND OPERATIONS PLANS

General perspectives

When the U.S. entered the nuclear age, it had a handful of crude, large, unassembled nuclear devices, ■ single type of relatively short-range, vulnerable heavy bomber capable of delivering nuclear bombs, two primitive weapons designs, and no alert posture. As the Cold War ended, the U.S had ■ robust, ready mix of strategic nuclear systems, spread across ■ number of delivery platforms. There were 25 weapons designs in the U.S. inventory in 1990 for strategic and theater nuclear weapons.

Currently, the U.S. and the former USSR each has ■ strategic nuclear force inventory in the 10,000 to 12,000 range. The START agreement signed in 1991 allows 6,000 accountable weapons. After START was signed, Gorbachev announced the USSR would reduce to 5,000 accountable weapons, clearly hoping that the U.S. would reciprocate. Attempting to keep track of the numbers is complicated by the fact that START counting rules, which account for all deployed weapons on ICBMs and SLBMs but undercount the slower, more stabilizing weapons carried on heavy bombers, allow a Party to deploy on the order of 9,000 actual weapons and still be compliant with START.

Many studies begun well before the events of late 1991 already call for deeper cuts in U.S. and Soviet nuclear forces to actual levels well below the START numbers. As stated earlier, the American public has ■ strong sentiment to eliminate what is not needed in the defense budget, and nuclear forces are no exception. Indeed, there have been many occasions in the past when the size of the U.S. nuclear force tended to be ■ surrogate for public impressions of security, and with that impression improving today, it is not surprising that calls for deep cuts in nuclear forces are emerging.

What is needed ■ this point to inform the public debate and to guide defense planning is some sense of a strategic weapons number which meets several criteria.

The requirement for ■ specified number of nuclear weapons should be associated with a coherent conception of what needs ■ be deterred in the new world order by nuclear forces, and what can be dealt with by non-nuclear strategic forces. It should preserve the distinctions between strategic and non-strategic nuclear weapons, which have been important to devising verification regimes. It should be consistent with a revised employment and targeting strategy, and should lend credibility to continued U.S. guarantees of nuclear deterrence extended to critical allies like Germany and Japan. And it should allow for a force posture whose characteristics hedge against likely trends and possible dangers in the immediate future.

This part of the study will address how we propose to bring these considerations together.

Targeting and employment strategy

The concept of deterrence for the new world order, discussed earlier in this paper, is best achieved by a strategy which holds selected targets at risk across a range of categories, with careful attention to escalation control.

Focusing exclusively on one target category would be hazardous. Since answers to the question "what deters?" are likely to be more problematic in the future than in the past, it is prudent not to restrict targeting options to a preconceived, and possibly wrong, single category of targets. A policy of holding a range of targets at risk is consistent with decreasing the number of nuclear weapons, as will be discussed shortly. The following applies primarily to targeting nuclear weapons.

One option is to directly target *urban populations*. This form of a "city-busting" strategy relies upon the least demanding targeting doctrine and can be pursued by the smallest numbers of nuclear weapons.

We reject any strategy which directly targets urban populations, on several grounds. A city targeting strategy is not likely to receive public support over the long run, and if this is the only option available to the President, there are many conceivable scenarios in which neither adversaries nor allies would find credible an American threat to destroy only the major population centers of the enemy.

Moreover, we strongly believe it is immoral to directly target civilians, and that this should be consciously avoided in U.S. targeting strategy. Morality is an admittedly complex subject. However, in terms of assessing intentions and consequences of targeting doctrine, there are subtle but important considerations. The question of civilian casualties falls in that category.

No responsible observer doubts that a major nuclear exchange would result in millions of casualties, including civilian casualties, whatever the targeting doctrine. However, the differences between intentionally attacking civilians, and attacking other targets (military, leaders, war-supporting industry and infrastructure) which will unavoidably result in civilian casualties, have been critical in Western thought on what is legitimate in warfare.

It has not been American policy to directly target civilians in combat, regardless of the weapons involved. The air phase of Desert Storm attacked urban targets with extreme discretion and conscious limitations, to minimize civilian casualties.

American targeting doctrine for the new world order not only should continue that practice, but should give even greater attention to options intended to minimize civilian casualties in nuclear or non-nuclear strikes, especially in the early phases of a crisis.

Massive casualties are an inevitable feature of escalating nuclear conflict, and for many leaders, this may well be the ultimate deterrent associated with the prospect of nuclear warfare. However, this does not require a doctrine which intentionally or solely targets civilians.

A second option, which we support, is to directly target *leadership*. The rationale for targeting leadership is declining, especially in the former USSR where democratic leaders are emerging. But that is not the only image of leadership for the new world order.

In a situation as transitional as the current one, it is important to define "leadership" carefully. "Leadership" means a hostile group of responsible authorities who control weapons that threaten the U.S. or its allies and friends. Whether such a hostile leadership group will reappear in the former USSR is problematic, as discussed earlier. Hostile leaders like Saddam Hussein certainly will appear in the Third World, perhaps in control of weapons of mass destruction.

The persuasive argument for holding senior leadership at risk is value added to deterrence. A leader like Saddam Hussein who engages in flagrant aggression should have to weigh whether he is personally at risk as a result of his actions. No despotic leaders should be allowed to believe that they can embark on major aggression against the United States, its deployed forces, or its allies and friends, while enjoying personal sanctuary from American weapons, including nuclear weapons.

Leadership targeting must incorporate withholds to protect the leadership of non-threatening (or supportive) republics or provinces of an aggressor state, and to allow for attempts at escalation control in an unfolding confrontation.

There is another tension in targeting leadership -- a tension between requirements and capabilities. Hardened command bunkers are difficult to attack, and leaders seek to avoid attack by moving rapidly and covertly from one location to another. A reasonable balance must be struck between requirements and capabilities for attacking leaders. In the emerging environment, that balance can favor fewer weapons.

A third option, which we also support, is to directly target *nuclear installations*. Nuclear installations should be held at risk much like leadership -- in ways which do not undermine the prospects of escalation control and which do not drive up the weapons requirements. Thus, targeting bomber bases, SSBN ports, ICBM support bases, mobile ICBM garrisons, nuclear storage bunkers, and other command nodes supports the concept of deterrence discussed earlier in this report.

As for ICBM silos, the NCA should have the option of ordering prompt delivery of a nuclear weapon on enemy silos, although the NCA may -- for reasons of escalation control -- choose to withhold such an attack if circumstances warrant a withhold. The rationale for attacking silos, as discussed earlier, is a highly selective version of damage control. In a START environment, where the silo force of possible adversaries probably will be no larger than 200 to 250 silos, there is not a high penalty paid in terms of number of U.S. weapons, in targeting a weapon against each silo.

With respect to mobile nuclear weapons systems, the U.S. should continue to explore means of locating the mobile weapons. As stated earlier, SSBN ports and mobile ICBM garrisons or bases should be targeted. However, options other than nuclear barrage should be used for attacking out-of-port SSBNs. In the absence of dramatic breakthroughs in the ability to locate and track mobile ICBMs, [redacted] would not recommend targeting those systems. If such breakthroughs occur, the issue of targeting mobile ICBMs could be revisited, looking carefully at the tradeoffs between cost and stability in any targeting strategy which holds large number of mobile systems at risk.

The fourth and fifth options, which we support and which will be discussed together, are to target _other military forces_ and to target _war-supporting industries and supporting infrastructures_ (such as transportation or energy networks).

Logically, targets associated with power projection -- in many cases, general purpose forces and their equipment – best fit this category. However, it may become difficult to preplan [redacted] number of those targets, especially for ground forces which are relocatable. Many ground forces and equipment can be expected to move out of central locations to dispersed field staging or deployment areas, prior to initiation of an attack. Unless the field staging areas are known well in advance (which cannot be assumed), preplanning attack options in [redacted] planning cycle measured in months cannot be relied upon in [redacted] sophisticated attack plan on power projection forces.

In addition to more adaptive planning, the challenges will be to employ network and nodal analysis to identify the highest leverage targets, and to seek high-value targets which are outside urban centers. Striking targets which [redacted] collocated with urban centers may be necessary for especially important attack options, but we do believe that nuclear war plans of the sort discussed later in this report frequently will be most credible and better support escalation control if targeting is kept away from large urban centers to the greatest extent possible.

Strategic force size - the rationale for reductions

There are several sound reasons for reducing numbers of strategic systems below the limits allowed by START. First, the U.S. does not need to maintain the larger numbers. A range of targeting options of the type discussed earlier can be supported at levels below START. This coincides with the public perception that the U.S. should eliminate what it doesn't need for defense.

Second, there are safety benefits associated with lower numbers -- fewer chances for nuclear accidents or incidents.

Third, fewer forces will cost less money. The savings may be smaller than anticipated, since reducing numbers may not significantly reduce infrastructure, in order to have a safe, effective operating force. But in [redacted] overall sense, which this study does not attempt to quantify, costs associated with smaller forces, over time, should be lower than today.

Finally, some have argued that lower force sizes reinforce policies aimed at discouraging proliferation. This is, [redacted] best, [redacted] third-order reason for reducing forces. Although Third World representatives in various arms control forums often cite the failure of the superpowers to reduce nuclear forces as [redacted] debating point supporting their overall criticisms of the U.S., it is unlikely that Saddam Hussein or other such leaders are seriously influenced by the question of how many nuclear weapons the U.S. has, as they put together their own agendas for covertly seeking nuclear weapons.

There may, however, be instances in which a leader in a fragile democracy can use U.S. force size as a relevant factor in internal debates on foregoing nuclear weapons. Thus, while the non-proliferation argument for reducing nuclear weapons should not be dismissed entirely, it is not as compelling a factor as strategic need, safety, and cost for reducing U.S. forces.

Strategic force size - how much to reduce?

There is a minimum force size below which the U.S. should not drop, at least not in the immediate future, until other problems are sorted out. Since the primary purpose of U.S. nuclear forces is to deter a large, hostile nuclear power from a variety of actions, since it also is to deter various second-order threats (conceivably even after a nuclear exchange), and since the U.S. also wishes to assure allies that they do not need to develop nuclear weapons of their own, a minimum force level is in order.

What one should look for is some sense of a number which responds to these types of considerations. The U.S. should maintain parity with the nuclear forces of the former USSR (while working to decrease that number), and also should maintain a substantial margin over the other world nuclear powers. As a rule of thumb, it appears best if the U.S. inventory at a minimum did not fall below the combined inventories of all "non-Soviet" forces, and remain at parity with the forces of the former USSR.

Although only one or two weapons can have ghastly effects, the concept of a minimum deterrent based upon a few hundred weapons or less is unrealistic. It is immoral to plan for a war which targets only civilians or cities *per se*, which is inherent in the minimum deterrent concept. Such an inventory also would be self-deterring to a major power. It allows for virtually no options, and is the least credible of all nuclear postures. No non-nuclear industrial power is going to believe security guarantees from a nation with this posture. They would be increasingly inclined to seek nuclear capabilities of their own.

Such low numbers also may be vulnerable to theater and perhaps strategic missile defenses, and very small arsenals invite cheating. Thus we conclude that a few hundred weapons is not a stabilizing or secure final goal.

Every recent study of strategic nuclear forces concludes with a number: "The United States can safely reduce to a strategic weapons if certain things do or do not happen." There are several problems with such a conclusion. As recent events have demonstrated, the ground shifts under the premises before the ink is dry on the study.

As stated earlier, we think the U.S. must maintain nuclear parity (i.e., essential equivalence) with the former USSR, while working to decrease the numbers. The U.S. also must maintain a substantial margin over the other nuclear powers. Defenses could play a major role in driving up the numbers. There is some minimum limit set by the industrial base needed to support (and if needed, reconstitute) the force, and it must be recognized that once U.S. nuclear stockpiles are cut, it will be difficult to rebuild them in the future, especially in the face of an ambiguous emerging threat.

This study does not settle on a single number, and points toward (for the reasons discussed earlier) avoiding a categorical "end-game" number, even one stated in conditional terms.

American security can be achieved with the numbers of weapons available after fully implementing START. For reasons of extended deterrence, it would be a matter of concern if arbitrary weapons levels approached the number of the combined nuclear forces outside the former USSR.

Thus, a strategic weapons inventory numbering in the 5,000 range (plus or minus 20%) seems a reasonable objective today, given the circumstances, realities, and uncertainties of the emerging world. However, the many uncertainties caution against committing to a firm number far into the future.

The triad and its C3I base

The concept of a triad of ICBMs, SLBMs, and bombers, resting on a robust, survivable base of command, control, communications and intelligence continues to make sense. Indeed, the logic of this concept becomes even more valid in the emerging world, at levels of weapons likely to be encountered over the next decade.

The U.S. force posture already is tending toward fewer types of systems and fewer nuclear weapon designs, and we expect that trend to continue. This means that the prospects and consequences of system failure are greater than today. Hedging against system failure across an entire leg of a triad that depends, for instance, on one missile or one nuclear weapon design, is accomplished more confidently when there are different systems in the other legs.

One leg of the triad may fail because of inadequate operational engineering support for the deployed forces. This has happened several times over the past 30 years, but fortunately such system failures make themselves apparent in peacetime. In the new world order, there should be time (days) to reposture the strategic forces if such a system failure is discovered. As a result some parts of the triad -- the bombers -- can be taken off alert. They may even be temporarily reassigned to non-nuclear/theater war missions without endangering the triad concept.

The traditional triad concept -- with heavy bombers and ICBMs on alert during periods of tension -- also complicated enemy attack planning, assuring the survival of at least one land-based leg and reducing the prospects of a panic-driven early decision to launch all the ICBMs.

If an adversary launches all his missiles simultaneously, and if his SSBNs are close to the U.S. shore, then he may be able to destroy the bomber force on the ground. However, he could not destroy alert ICBMs with such an attack, and U.S. ICBMs thus would have about 20 minutes after such a massive attack in which to launch prior to arrival of the first Soviet ICBM weapons. On the other hand, if he launches his SLBM and ICBM force for simultaneous impact on the U.S. (which maximizes his prospects of destroying the U.S. ICBM leg), there will be ample warning – again, in a case of alert in a crisis – for the U.S. bombers to escape.

The President's decision to take heavy bombers off alert and to reduce the number of ICBMs on day-to-day alert, retaining the capability to return to alert on short notice if necessary, is a reasonable response to new realities. Clearly, there is an even greater premium on strategic warning for this new U.S. posture.

It also is important to remember that the triad can protect against unexpected technical breakthroughs or intelligence failures which could temporarily shift the strategic balance by threatening one or two legs of the system, but not all legs simultaneously.

The triad still makes sense in a world where the U.S. faces opponents with thousands of nuclear weapons. If the strategic balance stabilizes at significantly lower numbers of systems, and cannot be readily reversed, the concept of the triad could be revisited, but again with emphasis on the risks resulting from system failure. Moreover, as will be discussed in the next section, we believe that from a strategic standpoint, the triad can safely shift to more emphasis on the sea-based ballistic missile leg.

SLBMs and SSBNs

There are no apparent developments on the horizon which would threaten the survivability of U.S. SSBNs, and thus in strategic terms we support the notion of moving to a force structure more heavily dependent on SLBM weapons. We have not attempted to assess the fiscal costs of this shift over the long run.

It seems wise for the foreseeable future to maintain roughly the current alert rate for SSBNs (assuming a force of 18 TRIDENT boats), since there is little to be saved or accomplished by decreasing their alert rates.

As the U.S. moves beyond the first phase of START to deeper cuts (which will likely happen), it becomes important to retain sufficient SSBNs to cover two oceans with an acceptable alert rate and with adequate leeway for reasonable overhaul schedules. Under deeper START cuts, the Ohio-class SSBN cannot count as 192 weapons and still permit retention of some ICBMs and a sufficiently robust sea-based force.

Thought should be given now to the optimum weapons load for the Ohio-class SSBN and for the next generation of SSBNs. In a new START environment, fewer weapons per SLBM is one way of reducing overall weapons numbers while maintaining a sufficient number of SSBNs.

Fewer weapons per SLBM also could lead to greater targeting flexibility, add range and footprint to the missile's capability, and leave open the option that excess throw weight could be used to deploy penetration aids, if defenses proliferate. At this point, about half a dozen warheads per SLBM appears to be a reasonable number to examine, for SLBM loadings in a new strategic environment with much lower Soviet numbers.

It also may make sense in future START environments to allow for varying the size and number of warheads carried by missiles on SSBNs (i.e., varying the loadings of missiles on a single SSBN, and loading the missiles on separate SSBNs differently). However, this must be weighed against the verification demands. The current START procedures (e.g., RV inspection procedures for SSBNs, and downloading limitations) were negotiated by the U.S. side to strike a reasonable balance between effective verification and minimizing operational impact on U.S. SSBN operations.

If the U.S. is prepared to accept looser verification provisions for SLBMs (perhaps more like the looser verification provisions for bomber weapons loadings), and if the Soviets can be convinced to accept this approach, it becomes easier to envision a treaty regime in which each SSBN carries -- and is counted for no more than -- its "customized" weapons load.

ICBMs

It would be more stable both for the U.S. and for post-Soviet authorities if land-based ICBMs were less heavily MIRVed. The difference between [redacted] single-RV ICBM and ICBMs with [redacted] or 3 RVs probably is not that great for crisis stability, although single-RV ICBMs offer greater targeting flexibility.

Parallel movement toward radically reducing the RV loadings for ICBMs, in a way which is not easily reversible, comes at a greater cost for the post-Soviet authorities than it does for the U.S. This is the case because [redacted] much greater percentage of their ICBM weapons are accounted for by the 10-RV SS-18s and SS-24s, especially [redacted] the post-Soviet ICBM forces draw down to START limits.

Thus, while [redacted] agree with the President's initiative to eventually eliminate all MIRVed ICBMs, [redacted] also [redacted] cognizant that the Soviets may attempt to extract concessions from the U.S. in exchange for that concession. Whether the tradeoffs are in the U.S. interest depends upon the details of the entire package.

While proceeding toward single-RV ICBMs, the U.S. should examine carefully the merits of maintaining throw weight parity in the nuclear balance. Some believe this is best done by deploying [redacted] single-RV Peacekeeper II, and argue that this could also turn out to be cheaper than any new, or massively overhauled old, ICBM. It also may serve to pressure the forces of the former USSR toward continued cuts in throw weight, and -- [redacted] was discussed with SLBMs -- gives the option of using excess throw weight for deploying penetration aids, if defenses proliferate.

The American ICBM program can keep mobility open [redacted] [redacted] theoretical option. So long [redacted] the U.S. has [redacted] ICBM program, expertise acquired to date in developing concepts and hardware for mobile ICBMs can be used to shorten the time for future development of [redacted] mobile system, if [redacted] threat justified the move, resources were available, and consensus formed within the U.S. Government to exercise [redacted] mobile option.

However, in light of the changed world conditions, deployment of U.S. mobile ICBMs does not appear to justify the expense, unless the strategic situation takes [redacted] radical change in [redacted] negative direction. Thus the President's decisions to cancel the rail-mobile Peacekeeper program and the mobile portion of the SICBM program also [redacted] reasonable.

Bombers

Bombers will play [redacted] ever more important role in the new world order because they are not destabilizing, [redacted] carry large payloads, and are very flexible.

Stealth is already enormously important and cost effective in [redacted] bomber. The benefits of the technology [redacted] amply demonstrated in the Gulf. The B-2 payload is quite large, allowing one aircraft to accomplish [redacted] complex strike mission. The continued and extended procurement of B-2 aircraft is in the national interest.

Even stealthy aircraft, and certainly B-1 and B-52 aircraft, will have [redacted] difficult time penetrating to heavily defended targets. As [redacted] result standoff weapons, preferably stealthy ones, will increase in importance. While the President's SRAM-II cancellation is understandable, some sort of SRAM or stealthy cruise missile will be needed in the future.

Long range cruise missiles

The advent of advanced non-nuclear munitions and the threat environment of the new world order already are blurring the distinctions between nuclear and non-nuclear strike missions for longer-range, standoff, precision munitions. Such precision munitions represent an important military capability which the U.S. needs in the emerging world. However, the blurring of the distinction raises difficult arms control problems [illegible] INF and START have demonstrated.

The INF approach was to ban nuclear and non-nuclear, ground-launched cruise and ballistic missiles in the 500 to 5500 kilometer ranges. This avoided distinguishability questions.

The START approach was to construct an elaborate scheme for ALCM distinguishability (which, while less rigorous than ballistic missile verification, still opens up many sensitive nuclear weapon storage areas to onsite inspectors), and to handle SLCMs as a political agreement outside of the START treaty, because of the verification difficulties.

The reluctance to engage in an SNF agreement with strict verification requirements stems in part from concerns that [illegible] formal SNF agreement would allow open-ended breakout unless potentially dual-capable launch systems (e.g., deployed artillery or multiple launch rocket systems) were subjected to highly intrusive inspections, which is not in the U.S. interest. Reciprocal, unilateral elimination of the nuclear warheads for short-range nuclear forces, without intrusive verification of remaining launch systems which conceivably could be nuclear capable, should resolve that problem.

As for nuclear Tomahawk land-attack missiles, the President's decision to remove these missiles from surface ships and attack submarines under normal circumstances, with the option to deploy them in crises, is sound under the circumstances.

It may be the case that the thresholds and political milieu of effective verification will be much more relaxed in the future than it has been in the past. It is premature to reach that conclusion, however. The problems posed by cruise missile distinguishability (nuclear from non-nuclear) are challenging today, and require careful thought as plans for future employment of heavy bombers and SLCMs in non-nuclear roles are further refined, and [illegible] future START regimes are envisioned.

Force aging and modernization

As force size shrinks and as fewer systems (with fewer weapons designs) are kept in the operational inventory for longer periods of time, surveillance programs which anticipate aging problems must receive much stronger emphasis and funding, and must be protected from the early budget cuts that such programs have undergone in the past.

It does seem advisable to have [illegible] least one large combat aircraft and one ballistic missile in development or production into the foreseeable future. Moreover, the next generation SSBN should be planned while boatyards retain competency with SSNs.

Theater nuclear forces

Past growth of theater nuclear forces, especially in Europe, was due to political as much as military reasons. The first American nuclear weapons intended for a so-called tactical rather than strategic role were deployed to Europe in the fall of 1953. In December 1954, NATO accepted that its future security would depend on theater nuclear weapons. The role of theater nuclear weapons in European security policy, and in regional security policies elsewhere, evolved considerably during the Cold War.

During the final years of the Cold War, theater nuclear forces were going down in size, and shifting away from shorter-range systems. The U.S. eliminated a number of seaborne nuclear systems, negotiated INF, canceled the follow-on to Lance, and announced conditions for reducing and eventually withdrawing nuclear artillery projectiles from Europe. The London Declaration of 1990 noted that in a transformed Europe, NATO will be able to adopt a new strategy making nuclear forces truly weapons of last resort. And the President's initiative of September 1991 -- subsequently endorsed by NATO's Nuclear Planning Group -- oriented American theater nuclear forces toward dual-capable aircraft.

The President's decision to eliminate short-range, nuclear-armed ballistic missiles and nuclear artillery shells extends this process. The risks they generate outweigh any likely usefulness in an (unlikely) invasion. Likewise, the President's decision to remove nuclear weapons from surface ships and attack submarines during peacetime operations seems reasonable if reciprocated by the post-Soviet authorities, with provisions to return them to deployment status in times of crisis, as needed.

The distinction between strategic and theater nuclear weapons is fading, especially at the doctrinal level, but the distinction may not disappear entirely, and there are some reasons for retaining at least part of the distinction. Theater weapons (for instance, very low yield or enhanced radiation weapons) are designed in part for possible use over friendly territory, while strategic weapon designs have emphasized other criteria.

Moreover, most theater nuclear weapons tend to be deployed on dual-capable systems, while two legs of the triad -- ICBMs and SLBMs -- have been purely nuclear. Considerations of cost savings, operational flexibility, and optimum employment of smaller forces argue for dual-capable launch platforms, but this is at odds with arms control regimes which emphasize effective verification and seek to minimize the potential for massive breakout, as discussed earlier. While verification tension will continue to exist with dual-capable aircraft and SLCMs, it makes sense at a minimum to continue treating ICBMs and SLBMs different from theater systems in an arms control sense.

Finally, the use of "theater" nuclear weapons can imply a distancing from the action, a lower rung on the escalation ladder. If the U.S. must use a nuclear weapon, it may be important that it not be launched from the CONUS. "Theater" weapons satisfy this requirement.

Non-nuclear and non-traditional weapons systems

With the advent of near zero CEP stealthy weapons, multi-spectral intelligence, and improved warhead lethality, it is now possible to launch non-nuclear strikes on C3I, defenses, and (if desired) leadership. Such capabilities could be very useful in escalation control. The same capabilities could be effective in contingencies involving small numbers of weapons launchers, manufacturing facilities, or storage sites in the target state. The Gulf War also focused attention on the need to attack specific sites like bunkers or nuclear facilities, with massive but geographically confined force.

The technology is now in hand to develop distributed surveillance systems, power projection weapons, and very low yield nuclear weapons in earth penetrators.

All the above merit serious attention.

Employment plans and the planning process

Since 1945, when the Target Committee met in Room 4E200 of the Pentagon to narrow the target list options for the first nuclear bombs, and the 509th Composite Group, Twentieth Air Force, devised employment tactics for the B-29s which would conduct the strikes, the U.S. has worked on various forms of nuclear war plans. This planning process became much more elaborate after 1960, when the JSTPS was created and the Single Integrated Operational Plan (SIOP) was adopted to coordinate service roles.

New attention must be given to adding more flexibility to U.S. weapons employment planning. However, since flexibility can become chaos during a crisis, any changes to the SIOP process must be carefully thought through.

There are several prominent reasons for retaining an orderly process to construct preplanned options for the use of nuclear weapons. By far the most important is that nuclear weapons cannot be treated casually. The decision to release them, for what purpose, must remain very structured, with every effort made to stop the errors of exhaustion and the fog of war from creeping in.

Other reasons for retaining the orderly process represented by the SIOP include:

- Arranging defense suppression.
- Deconflicting strikes between legs of the triad and each missile or bomber therein.
- Reinforcing the joint (multi-service) planning process.
- Retaining an institutional memory, especially important in target list development.
- Providing a focus for joint planning with NATO.

At the same time, there must also be a reasonable number of options built into the plans -- enough to deal with surprises, but not so many as to needlessly complicate the decision process.

And some options must involve adaptive planning. By that we mean the ability to update an employment plan in near real time for operational reasons. These might reflect changes in U.S. forces (e.g., a certain missile has gone off alert) or in the target structure (e.g., a command post or key defensive radar has moved). Carried to extremes, adaptive planning can become very expensive in terms of intelligence requirements. But the need for adaptive planning will grow [redacted] weapons numbers shrink.

And [redacted] capability must exist for contingency planning. By that we mean the development of new strike options on short notice for policy reasons (e.g., [redacted] proliferant threatens the United States).

Planning must also account for the sovereign status of the nuclear members of the new Commonwealth of Independent States (or its successor), allowing the United States – if circumstances require -- to deter each Commonwealth member separately (perhaps with the aid of other Commonwealth members), as well as deterring any possible Commonwealth-wide aggressions where nuclear weapons are relevant factors.

And most importantly, nuclear employment plans must pay even more attention to escalation control. The end of a rigid bipolar confrontation, the advent of new political structures, and the proliferation of weapons of [redacted] destruction introduce an added element of confusion and doubt into an already foggy nuclear equation. Nuclear employment plans must be sensitive to this new uncertainty, incorporating the soundest options available for not allowing future confrontations to escalate to Armageddon.

All of this calls for a totally new Integrated Strike Employment Plan.

THE AVAILABILITY OF SOUND NUCLEAR WEAPONS

The DOE nuclear weapons complex

The Department of Energy (DOE) is responsible for the design, testing, manufacture, assembly, and retirement of nuclear weapons. It produces "special nuclear material," as well [redacted] other weapon components, and it certifies the quality of the stockpile.

The infrastructure of the nuclear weapons complex dates back to the 1940's and consists of weapons laboratories, material production facilities, warhead production facilities, and test sites, located in [redacted] than a dozen states. DOE and the Department of Defense (DOD) operate [redacted] number of major facilities for testing delivery systems, and both agencies have scores of other research facilities which contribute to the U.S. nuclear posture.

Since 1945, the U.S. has manufactured thousands of warheads of over 70 types for over 100 kinds of weapons systems. In 1990, there were 25 active designs in the U.S. nuclear arsenal.

Currently the U.S. is producing no plutonium or highly enriched uranium, nor does it have the capacity to fabricate (i.e., cast, machine, and otherwise shape) the plutonium [redacted] already has. The reopening of the K-reactor may resolve the problem of no tritium production.

The DOE has been relying on materials produced in the past One of those materials, tritium, decays [redacted] the rate of 5% per year. In dealing with the lack of new tritium production and other problems, DOE has relied on "workarounds" to support the U S. nuclear posture. In the process, it has failed to meet certain delivery commitments to DOD.

Nuclear testing

The U.S. nuclear testing program is centered at the Nevada Test Site (NTS), north of Las Vegas. Since 1945, the U.S. has conducted over 825 nuclear tests, about 85% of which have been at the NTS. All the tests all have been underground since 1962.

The recent testing program has involved fewer than ■ dozen underground tests per year. This annual calendar of tests includes tests to advance weapons safety and security, very sophisticated physics experiments, tests to better understand nuclear effects, and joint tests with the UK.

The last Soviet nuclear test was in October 1990, at their far northern test range of Novaya Zemlya. Whether the post-Soviet authorities will (if they so choose) be able to resume nuclear testing at Novaya Zemlya or elsewhere is unclear. That appears to us to be one of the strongest motivating factors behind their continued call for ■ moratorium on nuclear testing.

Major Issues in the nuclear weapons complex

The four major issues now affecting the DOE weapons complex are:

- Safety (immunity to dropping, explosion, and fire).
- Security (making weapons theft-proof).
- The environmental status of the production complex.
- The ongoing debate on whether the U.S. should cease nuclear testing as part of a Comprehensive Test Ban (CTB).

As stated earlier, the U.S. currently does not produce plutonium or highly enriched uranium, and does not fabricate existing plutonium for nuclear weapons. This is due to decisions to shut down specialized facilities as the DOE explores how to clean them up and attempts to build consensus on ■ long-term modernization effort.

The U.S. still will require a nuclear weapons complex to support the types of forces discussed in this report as well as to disassemble retired weapons. At a minimum, that means design laboratories, tritium production and plutonium fabrication facilities, and some degree of nuclear testing. Conversion to tritium-free designs would require ■ massive program of testing, plutonium fabrication, and new manufacture.

Some have claimed that the decrease in warhead requirements means the U.S. can live off its present tritium inventory for decades, and that there is no need to resume tritium production. Tritium is the key to initiation of most modern nuclear weapons, certainly all U.S. weapons. It has a half life of 12 years.

Tritium production already has been shut down for almost half ■ decade. "Decades" is about the time needed to start any new, major, environmentally sensitive project in the U.S. Resumption of tritium production on ■ timely basis is important and deserves national support.

Although modernization of the nuclear weapons complex can proceed in an orderly and phased manner, it must proceed. Moreover, we believe that as the forces and numbers of weapons designs bécome smaller, it will be necessary to have even greater coordination between the establishment of requirements by DOD, the design of products by the weapons laboratories, and the production of those weapons by DOE.

It is not in the U.S. interest to negotiate a Comprehensive Test Ban (CTB) Treaty. To ensure a safe and secure nuclear posture, to hedge against the uncertainties associated with new nuclear designs, to retain the ability to respond to a radical reversal in world politics, to assure the reliability of existing weapons, and to do all this in an environmentally acceptable production complex, some degree of nuclear testing will be necessary so long as the United States has nuclear weapons.

However, in the face of the current moratorium initiated by the Soviet government and continued by the Commonwealth, and with the other radical changes in the former USSR, pressure is likely to build in the U.S. Congress to respond in kind, especially if the future direction of the U.S. nuclear posture is unclear. In addition to continuing to make the public case why some testing is critical for the U.S. as long as it has nuclear weapons, intermediate steps consistent with U.S. weapons plans should be identified, between the current position (a 150 kiloton threshold with unlimited right to test) and a CTB (no nuclear tests of any yield).

FUTURE DIRECTIONS IN NUCLEAR ARMS CONTROL

A mixed approach

The START Treaty took almost a decade to negotiate and resulted in an extensive document numbering several hundred pages. This has led some critics to argue that formal arms control should be abandoned in favor of arrangements that yield quicker results.

There is another option, however, which we favor and which appears to be implicit in the President's recent initiative. That is a mixed approach to nuclear arms control, especially for strategic systems.

Part of that approach involves formal negotiations – the long, tedious process of arriving at detailed agreements. The value of formal negotiations is that the final product reflects better understandings of the mutual problems and agendas. Such negotiations tend to institutionalize a process (much like the growth of legal precedent) which represents a contractual relationship, has legal standing in international law, and addresses and puts in place elaborate verification regimes.

The slow negotiating process also allows for continued, intense engagement of the Parties in pursuing (and revising) their security agendas in a structured context associated with delegations meeting in semi-permanent session, and with periodic foreign minister and summit meetings. This process also allows for reasonable interaction of the executive and legislative bodies, while retaining the essential element of executive initiative.

Assuming there are political authorities in the former USSR which can ratify and implement START and negotiate on a second phase of reductions and controls, we believe such negotiations are in the U.S. interest. Even if the United States finds itself dealing with several sovereign authorities (e.g., the Commonwealth, Russia, Ukraine, Belarus, Kazakhstan) rather than a single negotiating partner, formal negotiations on the nuclear balance still make sense for the reasons cited above.

At the same time, the U.S. should seek opportunities to enter into other cooperative arrangements which can be accomplished more quickly. These arrangements may have looser verification arrangements than formal treaties, but if selected with discretion, still can be stabilizing and mutually advantageous. One of the most important standards to apply to these arrangements is that they should not pose a significant risk to U.S. security if they are not carried out in detail. Many of these arrangements will not be subject to formal advice and consent by the Senate.

The U.S. also should seek even less formal arrangements, some of which may be parallel unilateral actions which can be done quickly to take advantage of opportunities in a favorable political environment. In all the above, the U.S. must be ready to deal with unique -- perhaps even bizarre -- arms reduction opportunities that may arise from discussions with various leaders in the former USSR.

START

The next phase of START should involve reductions to lower numbers. However, for the reasons discussed earlier, we believe it is premature to decide on the number at this time. It is possible to enter the next phase of negotiations with the general goal of further reductions, without committing at the outset to a final outcome.

Even getting to the force sizes allowed by the first phase of START will not happen quickly. The START treaty allows a seven-year reduction, with phases and progressively lower levels associated with each phase. For the USSR to reduce their ICBM silos from over 1,000 to something on the order of 200 to 250 silos, for instance, or to eliminate some 30 to 40 SSBNs, represents a major undertaking. That is the magnitude of reductions called for by the yet-to-be-ratified START treaty, however, and it may go even deeper if the Soviets reduce to the 5000 level called for by Gorbachev.

Eliminating strategic systems is a costly, complicated industrial endeavor which, if not done carefully, poses significant safety and environmental problems. Moreover, the eliminations are subject to strict procedures and on-site inspection of the process -- elements of the treaty which minimize the prospects for quickly reversing the process.

Of course, systems can be taken off alert before they are eliminated, and both the U.S. and the Soviets have announced their attention to take some ICBMs off alert. However, these systems can be returned to alert, in some cases rapidly. Again, that points up the importance of formal procedures to eliminate strategic systems in ways not easily reversible.

The thrust of the U.S. approach to formal arms control in this area should be to negotiate a second phase of START in an orderly fashion. The second phase should build upon the reductions and constraints negotiated in the first phase, and should carefully avoid tradeoffs which are not in the U.S. interest (like compromising sensitive technologies for conventional cruise missiles).

The next phase of START also should continue to concentrate on the least stabilizing systems, the heavily MIRVed, land-based ICBMs.

ABM Treaty

With consensus building in the U.S. Government that limited ballistic missile defenses are needed in the emerging security environment, the challenge will be to build those defenses consistent with the ABM Treaty. The evolving consensus appears to favor a thin strategic ballistic missile defense which complies with the ABM Treaty (or a modified ABM Treaty), and virtually unlimited theater missile defenses.

The dividing line between even a reasonably effective theater anti-missile missile, and the least effective strategic anti-missile missile, is blurring, especially when these systems are associated with robust queuing systems for intercepts.

In response to the President's initiative, central authorities in the USSR have indicated a willingness to entertain U.S. proposals for how to proceed. However, it still is unclear how much those authorities will agree, and in what detail, to actually modifying the ABM Treaty The issue of interceptors in space is likely to remain one of the more contentious issues.

It also is unclear how quickly any authorities in the former USSR can make firm commitments which will be accepted by their constituencies and fellow authorities. This could become a problem in the near term if reviews underway within the U.S. conclude that effective theater missile defenses cannot be developed and tested without some relief from the ABM Treaty.

Nuclear Non-Proliferation Treaty

The Nuclear Non-Proliferation Treaty (NPT) was signed in 1968 and entered into force in 1970. The terms of the treaty state that 25 years after entry into force, a conference shall be convened to decide whether the treaty shall continue in force indefinitely, or shall be extended for an additional fixed period or periods. That conference will take place in 1995.

It is in the U.S. interest for the NPT to continue, and to be strengthened. However, the NPT alone cannot be relied upon as a guarantor that nuclear proliferation will not take place. Iraq, for instance, has been a Party to the NPT since 1969. The willingness of France and China to join the NPT are encouraging, but neither NPT membership nor an enhanced NPT regime are likely, by themselves, to cope with the proliferation problem.

Thus, while the U.S. should continue to seek a more effective approach to proliferation, as discussed earlier in the study, and should continue to support the NPT as a centerpiece of the regime for attempting to contain nuclear non-proliferation, other mechanisms also must be sought to deal with the proliferation of advanced weapons globally.

Disassembling nuclear weapons under international safeguards

The other measure we would recommend for immediate attention is a mutual program with the successors in the former USSR to disassemble weapons being removed from service, especially the older tactical nuclear weapons. Initial talks between U S authorities and the leaders in the former USSR are proceeding in this direction.

By "disassemble" we mean, at a minimum, separation of the fissile cores from their high-explosives and other subcomponents. How far the disassembly of an individual weapon should go depends in the short run on the arrangements for storage. If conditions in the former USSR continue to deteriorate, secure storage and confident accounting of fissile materials becomes increasingly critical.

Acquiring fissile materials is the most difficult part of a Third World covert nuclear weapons program. It is not difficult to envision realistic future scenarios in which both the supplier and recipient may welcome quiet diversion of former Soviet fissile materials in exchange for cash.

Thus, it may be desirable in the near term to keep the special nuclear materials together at least in the form of a weapons core, which is more easily accountable and secure from diversion than special nuclear materials in other, much smaller and more easily concealed forms.

This is an area in which radically new measures also should be explored, including international storage of some (perhaps a significant portion) of the disassembled weapons, under the auspices of the U.N. with U.N. monitors at the storage sites.

Over the longer term, the cores themselves may be disassembled, and the special nuclear materials diverted to use in power reactors.

The United States should be prepared to fund a significant portion of near-term disassembly of Soviet nuclear weapons, even beyond the level of funding discussed to date.

The willingness of the U.S. to place its special nuclear materials from disassembled weapons under international auspices also could provide powerful arguments for advancing the cause of non-proliferation in the Third World.

This is an activity which requires constant policy attention at the highest levels. It must not be allowed to slow down.

CONCLUDING REMARKS

In reflecting on the role of nuclear weapons in the new world order, old thinking and new thinking need to be merged into clear thinking.

History has not ended. As the President aptly said in his address to the United Nations in the fall of 1991, history has, in one sense, resumed. The American people have emerged from a dangerous, confrontational era into a period characterized by high hopes for a future world order based upon cooperative endeavors and the rule of law. This is not the first time that nations have experienced a certain sense of euphoria -- a belief that all things are possible -- in the first afterglow of victory after a massive contest.

The Cold War ended in a victory for the enlightenment ideals and values that energized the American experience from its earliest days, and inspired the Atlantic Alliance, an unparalleled success for like-minded democracies.

However, for all the hopes and expectations, the world remains a dangerous place, for reasons discussed earlier in this study. Not the least of those reasons is the enormous destructive power of nuclear weapons, and the simple fact that the human race cannot and will not undergo nuclear amnesia. For the foreseeable future, the U.S. faces the prospect that nations or groups hostile to American interests can possess nuclear weapons, and can use those weapons as a minimum to kill large numbers of American citizens and destroy American cities.

As the U.S. disengages from the Cold War and seeks to influence the evolution of a new world order, its stance toward nuclear weapons will be important in a number of subtle ways, stretching beyond the deterrent landscapes explored in this study. Responsible stewardship of the American nuclear arsenal sets an example for others. Adapting new technologies for non-nuclear warfare can raise the nuclear threshold. An orderly, reasonable adjustment of forces no longer needed, accompanied by compelling rationales for forces retained, inspires confidence in American leadership.

In 1933, in discussing the British plan submitted to the Geneva Conference on Disarmament, Winston Churchill said: "I am very doubtful whether there is any use in pressing national disarmament to a point where nations think their safety is compromised, while the quarrels which divide them and which lead to their armaments and their fears are still unadjusted."

Churchill went on to say, "I have always hoped that the continuance of a long peace and the pressures of taxation would lead to a gradual, progressive neglect of armaments in all countries, as was the case after the conclusion of the great Napoleonic wars."[9]

Whether the new world order will usher in a long peace and a gradual, progressive neglect of armaments in all countries remains unclear. Until that day, U.S. policy for the role of its nuclear weapons in the new world order must deal with the realities, trends, and expectations discussed in this study.

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[9] Winston Churchill, *Why England Slept* (1938).

ANNEX A

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ANNEX B

WHO IS THE U.S. DETERRING, FROM DOING WHAT, AND WHAT IS THE ROLE FOR U.S. NUCLEAR WEAPONS IN THE NEW WORLD ORDER?

There is broad agreement that the above question is fundamental. It also is very difficult to answer in a thoughtful, detailed way without getting lost in an immense web of issues, relationships, unstated assumptions, and hidden values. Characterizing the association of resources to power and influence always has been challenging, and in the emerging world will be more challenging than ever.

The following discussion should not be viewed as a precise description of the role of U.S. nuclear weapons, but an attempt to think through the likely paths and structures of the new world order, the abiding U.S. interests, the challenges to those interests, and the role of nuclear weapons in helping American policy makers master those challenges.

Methodology

This discussion reflects an exercise in which a number of people – including many listed in Annex A – were asked to register their subjective reactions to various options, summarized in the matrix listed at the end of this section. This Delphi exercise was conducted during the summer of 1991, prior to the coup in the USSR. The phrasing of the matrix reflects that fact, and some of its language now sounds archaic, given the dramatic events of the second half of the year. However, the findings of the exercise are worth reprinting as a long-term effort to anticipate the changing role of nuclear weapons in the rapidly changing world.

The options in the matrix were chosen by rephrasing the question listed in the title of this annex, in terms of the following.

"*Who*" covers four major categories of actors: the USSR (a shorthand used in the matrix to identify whatever post-Soviet society retains the bulk of the Soviet nuclear forces), China, other nuclear-weapon states (a shorthand also used to cover non-state nuclear terrorists), and non-nuclear weapons states.

"*From doing what*" covers several categories of actions: attack on the U.S. homeland, on U.S. forces abroad, on U.S. allies or friends, or on others, with nuclear, chemical, biological or conventional weapons; or attempted coercion of the U.S., of its allies or friends, or of others.

"*U.S. nuclear weapons*" are divided into two groupings: (a) what traditionally have been thought of as the central strategic nuclear forces (labeled SIOP forces in the matrix at Annex C, but also including some reserve forces, as well as central strategic forces available for limited nuclear options), and (b) theater nuclear forces (TNF).

Participants in the matrix exercise were asked to assign a value of 0 to 10 points to each option – zero reflecting the judgment that U.S. nuclear weapons would play no role in deterring actions of the sort listed in the option, and 10 that they would play a major role.

To describe the results, the following descriptive phrases were chosen: *significant role (for* *options which consistently received a value of 8-10), material role (5-7), and background role, or at best, a very small role, for options largely valued below 5.*

As stated before, the aim was not precision but some sense of where nuclear weapons may still have a role, taking into account the trends discussed earlier in this report, the possible threats to U.S. security interests, some appreciation of what nuclear weapons can or cannot deter, the likely credibility of deterrence in given instances, and the support of the American public for certain sorts of policies.

The role of central strategic nuclear forces in the new world order

Central strategic nuclear forces will play a *significant role* relative to the nuclear forces of the former USSR.

So long as large nuclear forces exist in this region, and until a reasonably long experience of positive political evolution, the U.S. cannot be assured that currently favorable trends will not be reversed.

If a hostile post-Gorbachev leadership in control of nuclear weapons emerged, then U.S. central strategic nuclear forces would be important for deterring nuclear attack on the U.S. or on U.S. forces abroad, or coercion of the U.S. Although the likelihood of a sudden, hostile reversal may be low, the consequences could be lethal if the U.S. dismantled its nuclear arsenal far below the nuclear arsenal on the territories of the former USSR. Moreover, U.S. central strategic nuclear forces are one elements encouraging peaceful evolution in the former USSR, by making it obvious to all concerned that they could not reverse the process and gain superior advantage over the U.S.

As the strategic nuclear forces of the former USSR are reduced, the U.S. can safely lower the size (and perhaps change the character) of its central strategic nuclear forces.

U.S. central strategic nuclear forces can play a *material role* with respect to other crises in which nuclear, chemical, or biological weapons are a factor. Specifically, these forces play a material role in deterring:

- the former USSR from nuclear attack on U.S. allies or friends; or from CW/BW attack on the U.S., on U.S. forces abroad, or on U.S. allies or friends.
- China from nuclear attack on the U.S., or on U.S. allies or friends; or from coercion of the U.S. or of its allies or friends.
- Other nuclear weapon states from nuclear attack on, or coercion of, the US.

Central strategic forces also can play a *background role* in a number of other areas, including instances involving nations like the USSR or China, in which purely conventional conflict is a factor. That is to say, central strategic forces -- and their influence -- always will be part of the backdrop to challenges to U.S. interests, but the influence will vary depending on the circumstances, and cannot be reliably described beforehand

Future U.S. central strategic nuclear forces probably likely will play *a very small role* , if any.

in deterring:

- the former USSR or China from CW/BW or from conventional attack on, or coercion of, states that are not allies or friends of the U.S.

- other nuclear and non-nuclear weapon states from conventional attack on, or coercion of, states that are not allies or friends of the U.S.; or from conventional attack on U.S. allies or friends.

The role of theater nuclear forces in the new world order

President Bush's September initiative, and subsequent discussions with the Soviets, within NATO, and with the South Koreans, point to a rapid drawdown of the size and composition of theater nuclear forces. They do not, however, change the thrust of the conclusions on the future role of theater nuclear forces -- conclusions which were not dependent on size, on particular systems, or on the timing reintroducing theater nuclear forces into a crisis area.

In crisis situations, U.S. theater nuclear forces, including maritime nuclear forces (other than SLBMs), can play a *significant role* in deterring:

- the former USSR from nuclear or CW/BW attack on U.S. forces abroad or on U.S. allies or friends.

- China from nuclear attack on U.S. allies or friends.

- other nuclear weapon states from nuclear attack on the US.

In crisis situations, U.S. theater nuclear forces can play a *material role* in deterring:

- China from nuclear attack on U.S. forces abroad; from CW/BW attack on U.S.allies or friends; or from coercion of the U.S. of of its allies or friends.

- nuclear weapon states other than the USSR or China from nuclear attack on US forces abroad, or on US allies or friends; from CW/BW attack on the U.S., on U.S. forces abroad, or on US allies or friends; or from coercion of the U.S.

U.S. theater nuclear forces can play a *background role* in a number of other areas, including many areas of purely conventional conflict. Again, this reflects an influence hard to define in advance.

U.S. theater nuclear forces probably will play *a very small role* , if any, in deterring:

- the former USSR from conventional attack on, or coercion of, states that are not friends or allies of the U.S.

- China and non-nuclear weapon states from conventional or CW/BW attack on, or coercion of, states that are not friends or allies of the U.S.

- other nuclear weapon states from conventional attack on U.S. allies and friends, or on others.

The matrix results (and instructions for using the matrix) are as follows.

MATRIX EXPLANATION

1. The matrix is designed to give a structured framework for addressing two questions:

a. Who is to be deterred from doing what?

b. To what extent are the U.S. nuclear forces relevant to such deterrence?

2. "Who" is dealt with in four categories: the USSR, China, Other Nuclear Weapon States, and Non-Nuclear Weapon States. For purposes of the matrix, the category of "Other Nuclear Weapon States" is considered to include the following:

1980s: the two other acknowledged nuclear weapon states, the UK and France, and several states that either have, or are near to having nuclear weapons: Israel, India, Pakistan, and South Africa.

1990s: the above plus North Korea, Libya, and Iran. Although efforts are underway to dismantle Iraq's nuclear program, for the purposes of this paper Iraq also can be considered a nuclear weapon state in the 1990s.

The reader may wish to add other nuclear weapon states to this list, e.g., South Korea, Taiwan, Argentina, Brazil, Germany, or Japan.

3. "U.S. nuclear forces" are dealt with as SIOP forces or theater forces.

4. The questions are posed for the late Cold War and early Post-Cold War periods. The events of 1990 roughly constitute the demarcation point between those two eras.

5. There are 17 types of action identified for the "from which" column, e.g., attack on the U.S. homeland with nuclear weapons. The option is left open for adding other types of action.

6. "Coercion" means serious, major state action backed by the threat--explicit or otherwise--of force. Soviet behavior in the Berlin crises and American behavior in the Cuban missile crisis are examples of attempted coercion, unsuccessful and successful respectively.

7. "Allies" are understood to mean what is commonly referred to as allies and friends of the U.S., i.e., formal allies (through relations like NATO or bilateral treaties) or informal allies where it commonly is understood the U.S. has commitments to a nation's defense, e.g., Taiwan.

8. With the above conditions and the types of action limited to 17, a total of 272 questions are generated: 136 for the late Cold War era and 136 for the early Post-Cold War. Using a scale of 0-10 (where 10 means that U.S. nuclear weapons play a central, major role in deterring a specified activity), the reader is asked to place a relative value on the role of U.S. nuclear weapons in deterring a certain type of action. The numbers you find inserted in the attached matrices reflect the sentiment of the Washington DC Matrix Committee based upon several discussions. Your numbers may differ.

EXAMPLES:

Assigning a 10 to the column for Cold War, SIOP forces in deterring a Soviet attack with nuclear weapons on the U.S. homeland means that the nuclear weapons in the SIOP played a central, major role in this deterrence.

Assigning an 8 to the column for Post-Cold War forces in deterring a non-nuclear weapon state from initially acquiring nuclear weapons reflects a judgment that nuclear deterrence extended by the U.S. to a state like Germany or Japan is a significant factor in their decisions not to acquire an independent nuclear weapons posture.

Who is to be deterred from doing what?
To what extent are U.S. nuclear forces relevant to such deterrence?

Deter Whom?	From What?	Rel Value of US Nuc Wpns			
		1980s		1990s	
		SIOP	Theater	SIOP	Theater
USSR	**Attack on US homeland**				
	• with nuc weapons	10	6	10	4
	• with CW/BW	6	3	6	3
	• with conv wpns	[redacted]	1	[redacted]	1
	Attack [redacted] US forces abroad				
	• with [redacted] weapons	[redacted]	9	9	9
	• with CW/BW	8	9	7	8
	• with conv wpns	5	7	3	4
	Attack on US allies				
	• with nuc weapons	7	9	6	8
	• with CW/BW	7	8	5	8
	• with conv wpns	6	8	2	4
	Attack on others				
	• with nuc weapons	3	3	2	2
	• with CW/BW	1	1	0	1
	• with conv wpns	0	0	0	[redacted]
	Attempts to coerce				
	• US	9	7	8	6
	• Allies of US	7	7	4	4
	• Others	0	0	0	0
	Acquiring nuc weapons				
	• initially	N/A	N/A	N/A	N/A
	• larger arsenals	3	3	3	2
	Other activities (specify)				
	•				
	•				
	•				
	•				
	•				
	•				

Relative Value of US Nuc Forces to Deterrence

Not Relevant					Moderate Role					Central, Major Role
0	1	2	3	4	5	6	7	8	9	10

Who is to be deterred from doing what?
To what extent are U.S. nuclear forces relevant to such deterrence?

Deter Whom?	From What?	Rel Value of US Nuc Wpns			
		1980s		1990s	
		SIOP	Theater	SIOP	Theater
China	Attack on US homeland				
	• with nuc weapons	6	3	6	3
	• with CW/BW	3	2	2	2
	• with conv wpns	2	2	1	1
	Attack on US forces abroad				
	• with nuc weapons	4	6	4	6
	• with CW/BW	3	4	3	4
	• with conv wpns	3	3	2	3
	Attack on US allies				
	• with nuc weapons	8	9	6	8
	• with CW/BW	6	8	4	7
	• with conv wpns	4	6	3	4
	Attack on others				
	• with nuc weapons	2	3	2	2
	• with CW/BW	0	1	0	0
	• with conv wpns	0	0	0	0
	Attempts to coerce				
	• US	6	6	6	6
	• Allies of US	7	7	6	7
	• Others	1	1	0	0
	Acquiring nuc weapons				
	• Initially	N/A	N/A	N/A	N/A
	• larger arsenals	6	6	4	4
	Other activities (specify)				
	•				
	•				
	•				
	•				
	•				
	•				

Relative Value of US Nuc Forces to Deterrence

Not Relevant				Moderate Role					Central, Major Role	
0	1	2	3	4	5	6	7	8	9	10

Who is to be deterred from doing what?
To what extent [redacted] U.S. nuclear forces relevant to such deterrence?

Deter Whom?	From What?	Rel Value of US Nuc Wpns			
		1980s		1990s	
		SIOP	Theater	SIOP	Theater
Other Nuclear Weapon States	Attack on US homeland				
	▪ with [redacted] weapons	1	1	6	8
	▪ with CW/BW	1	1	4	7
	▪ with [redacted] wpns	0	0	1	0
	Attack on US forces abroad				
	• with nuc weapons	1	1	4	7
	• with CW/BW	1	1	3	7
	▪ with conv wpns	0	0	0	0
	Attack on US allies				
	• with nuc weapons	1	1	2	7
	▪ with CW/BW	1	1	1	6
	• with conv wpns	0	0	0	0
	Attack on others				
	• with nuc weapons	1	1	3	3
	▪ with CW/BW	0	0	0	1
	▪ with conv wpns	0	0	0	0
	Attempts to coerce				
	▪ US	1	1	5	6
	▪ Allies of US	1	1	1	2
	▪ Others	0	0	0	1
	Acquiring nuc weapons				
	• initially	N/A	N/A	N/A	N/A
	• larger arsenals	3	2	2	1
	Other activities (specify)				
	•				
	•				
	•				
	•				
	•				
	•				

Relative Value of US Nuc Forces to Deterrence

Not Relevant					Moderate Role					Central, Major Role
0	1	2	3	4	5	6	7	8	9	10

Who is to be deterred from doing what?
To what extent are U.S. nuclear forces relevant to such deterrence?

Deter Whom?	From What?	Rel Value of US Nuc Wpns			
		1980s		1990s	
		SIOP	Theater	SIOP	Theater
Non-Nuclear Weapon States	Attack on US homeland				
	• with nuc weapons	N/A	N/A	N/A	N/A
	• with CW/BW	2	4	3	3
	• with conv wpns	2	2	2	3
	Attack on US forces abroad				
	• with nuc weapons	N/A	N/A	N/A	N/A
	• with CW/BW	3	8	3	7
	• with conv wpns	0	8	1	2
	Attack on US allies				
	• with nuc weapons	N/A	N/A	N/A	N/A
	• with CW/BW	2	8	2	6
	• with conv wpns	1	8	0	2
	Attack on others				
	• with nuc weapons	N/A	N/A	N/A	N/A
	• with CW/BW	0	0	0	0
	• with conv wpns	0	0	0	0
	Attempts to coerce				
	• US	[illegible]	[illegible]	1	[illegible]
	• Allies of US	1	3	1	2
	• Others	[illegible]	[illegible]	[illegible]	[illegible]
	Acquiring nuc weapons				
	• initially	3	3	2	6
	• larger arsenals	N/A	N/A	N/A	N/A
	Other activities (specify)				
	•				
	•				
	•				
	•				
	•				
	•				

Relative Value of US Nuc Forces to Deterrence

Not Relevant					Moderate Role					Central, Major Role
0	1	2	3	4	5	6	7	8	9	10

Mr. SPRATT. Mr. May.

STATEMENT OF MICHAEL MAY, FORMER DIRECTOR, LAWRENCE LIVERMORE NATIONAL LABORATORY

Mr. MAY. Thank you, Mr. Chairman.

In my testimony today, I would like to do four things. First, I would like to briefly summarize the conclusions reached by the National Academy of Sciences study about the U.S.-Soviet nuclear relationship.

Second, I would like to review and comment briefly on the current weapons situation in the former Soviet Union, the Commonwealth of Independent States.

Third, I would like to discuss a factor that may drive nuclear proliferation today.

Fourth, I will discuss approaches to some of the problems of nuclear proliferation and in particular, talk about the question of a more cooperative world security order, which is very much on the minds of people these days, and which is being studied and discussed.

So I will be going off in a somewhat different direction than Mr. Reed, at least in my latter comments. The latter comments in this testimony are my own views, and not the views of the National Academy or anyone else.

In my prepared statement, I will not address two of the four questions that were listed by yourself and Mr. Kyl, namely the conventional forces and the defenses, but I would be happy to talk about those two topics following my statement.

On the first topic, the National Academy study, the study was carried out by a committee of the Academy, the Committee on International Security and Arms Control. It is a standing committee that has been in existence for about 9 or 10 years and it meets regularly with equivalent groups of people from the Soviet Union, Russia now, and occasionally from China and other countries.

The committee is composed of scientists, political scientists, retired military officers, and retired government officials with experience in nuclear weapons and arms control.

The study was started in early 1990 and ended in early September 1991, just before the President made his historic proposal for deep cuts and for pull-backs in nuclear weapons, and just before President Gorbachev's positive response in October.

Briefly speaking, the study foreshadowed what has been happening since. It recommended bilateral cuts in strategic nuclear weapons, predicated on a success at START, to about half of the START level, that is about 3,000 or 4,000 weapons.

It recommended similar bilateral cuts in tactical nuclear weapons to an unspecified level, but a lower one, in concert with our NATO allies. It emphasized that these actions should be taken in concert with our allies, as of course they have been.

It recommended that we eliminate tactical nuclear weapons from surface ships, again in concurrence with the allies, and also eliminate all ground based tactical nuclear weapons outside of the United States. All of this should be done in negotiation with Russia.

It also recommended some specific improvements in command and control of nuclear weapons, which I would be glad to go into in the question period.

For some years, a number of studies had come to the conclusion that the number of nuclear weapons on both sides exceeded targeting requirements. In fact, the numbers on all sides—on our side, at least—was really based on a fundamental level of deployment that had been decided upon in the Eisenhower administration. Since that time, technological improvements and the political dynamics have led to ever larger numbers of weapons in excess of those that had seen us through the worst days of the cold war.

With President Gorbachev's initiatives, particularly the withdrawal of Soviet forces from Central Europe, it became possible—politically and strategically—to reduce these numbers to a much more economical level.

I might comment that the number which the Academy study suggested as a result of bilateral actions are not all that different from the numbers which Mr. Reed's committee suggested. We came up with 3,000 to 4,000 strategic and a small number of tactical weapons. Mr. Reed's committee came up with about 5,000 strategic weapons, I believe. Those are the numbers that we believe could be reached in bilateral discussions and negotiations with Russia, without bringing in the rest of the world.

This is now well-accepted by the civilian and military leadership in both the United States and Russia, and so what I will do is make three additional points that were made in the study and that may be useful at this point.

First of all, even deep cuts do not mean the end of the need for modernization. In particular, nuclear weapons systems must remain invulnerable to attack in whatever state of alert they happen to be: alert or non-alert. If they are not invulnerable to attack to a large degree, they are not going to constitute a deterrent to future aggressive action. In fact, the lower the numbers go, the more important this invulnerability is. Modernization is also needed to maintain and improve standards of safety and security as Mr. Reed noted.

Of course, we do not anticipate that the present Russian leadership is going to take any aggressive action, although they do have the nuclear weapons. But the nuclear force policy that we lay down now in these years is likely to govern decisions for sometime to come. Nuclear deterrence is aimed down the line at preventing, deterring and discouraging aggressive actions. It may play a political role in preventing potentially dangerous demagogues from coming to power in the first place. If nuclear forces are to play this role, no matter how small, they have to meet a standard of invulnerability, operability, safety and security required of any deterrent force.

Now this being said, it is clear that for some time to come, we can rely on existing systems. We can select for elimination the more obsolete and vulnerable among them, and the rate and the cost of modernization can certainly go down considerably and in fact has gone down.

In addition, as you noted, Mr. Chairman, the numbers given in the study are not the lowest possible numbers. They were chosen as numbers that could be reached by bilateral agreements. The study also pointed out that, if you could get reliable security cooperation and arms control agreements among all of the world's nuclear powers and potential nuclear powers, you could go down to levels of 1,000 or fewer. The study noted that that's not the world as it is today, but it may well be the world some years from now.

I want to emphasize that what is needed to reach that goal is not just formal agreements on numbers, but also an overall pattern of security cooperation. A decision about nuclear weapons either in this country or in other countries cannot be divorced from overall security considerations. In everybody's mind, our minds and the minds of other countries, they are tied together with overall security. That matters for deep cuts and it matters for nuclear proliferation.

The second point is that, as a nuclear weapons systems go off alert on both sides, as has been noted by members of the committee, and as Russia evolves from an enemy to a nation that we have more normal relations with, target selection and targeting doctrine do not play the key roles that they used to play when the systems were ready to go at a few minutes' notice and when their purpose was well defined.

As the systems go off alert and as they fulfill a more general deterrent purpose, the size of the force will be set by factors such as the need to retain leverage with the world's nuclear powers and deterring other potential threats to the United States. The weapons themselves, rather than being targeted against specific objectives, will be held in reserve, much as other elements of our forces are.

The third point I would like to make is that, again, from the National Academy study, in the view of the committee, U.S. security would be best served if nuclear weapons came to serve no other purpose than to deter the use or threat of nuclear weapons by others.

Now that is not entirely up to us. If some very major, but nonnuclear threat were to arise again, such as the threat that Stalin posed in Europe, nuclear weapons would presumably again play a deterrent role whether that was planned or not. But we believe it is not in the U.S. interest to keep nuclear weapons in the forefront of our deterrent posture or military plans. This is in agreement with statements which the President has made and Mr. Reed also.

The existence of nuclear weapons, although we are stuck with them, does not fundamentally help the United States. On the contrary, it makes the United States much more vulnerable than it would otherwise be. That is true, as well, of other rich and developed countries and so, there is a consensus among these countries that nuclear weapons should be deterrents of last resort. We believe that strengthening this consensus is a major national interest of the United States, not to be sacrificed lightly. A little later in the talk, I will talk about ways in which this consensus can be strengthened.

Now my second topic is the status of nuclear weapons in the CIS, in the former Soviet Union. As members of this committee know, the United States and Russia are now engaged in an unprecedented cooperative effort to retrieve nuclear weapons from the other CIS republics where they remain, namely, Ukraine, Belarus and Kazakhstan.

The nuclear weapons in the other parts of the former Soviet Union and Eastern Europe, the Baltic Republics, the Transcaucases have already been returned to Russia, according to Russian authorities and Commonwealth authorities.

The agreement is that all remaining tactical nuclear weapons are to be returned by July 1 of this year and all remaining strategic weapons outside of Russia by 1994. The republics, except Kazakhstan, have agreed to this in principle, although President Kravchuk of Ukraine has said in March that he was holding up the transfer in order to insure that the weapons were destroyed. Of course, more recently President Kravchuk and President Yeltsin are having difficulties over the Navy in the Black Sea.

Now, the National Academy Committee did not foresee the breakup of the Soviet Union in detail. It did foresee, however, that if the breakup occurred, a successor government of the Soviet Union might well wish to do exactly what it has done, namely, continue reductions and seek cooperative arrangements with the United States and European states.

Let me comment briefly on two aspects of this complicated process which is unfolding before our eyes and which I think none of us can quite see to the end of.

The first comment I will make is that the agreements between the United States and Russia beyond START so far consist of speeches and are informal. It seems to me that both ratification of START and clearly codified agreements beyond START are needed if we are to proceed without the doubts and questions on both sides that could eventually poison the relationship.

We do not know who the future leaders of Russia will be and we do not know what pressure they are going to be working under. It is true that it is fundamentally in the interest of both the United States and Russia to reduce these weapons and limit their danger. Neither the United States nor Russia needs nuclear weapons to be powerful. Both are vulnerable to them so there is a strong lasting basis for cooperation on this subject. But this strong lasting basis might be overlooked at times of stress, particularly as future Russian leaders deal with nationalist pressures and possibly with resentment over Russia's slide from its earlier status. So I believe it is to our advantage to nail agreements down as clearly as possible and to develop a constituency within the military and civilian establishment for working out modes of cooperation in nuclear matters.

The second aspect of the process that I will comment on is the bargaining over nuclear weapons that is now going on among the republics: Russia, Ukraine, Kazakhstan, Belarus to a lesser extent, and the United States.

Now the motives on the republics' side probably include domestic political appeal in certain parts of their constituency. It probably includes also the desire for money. The United States, itself, has put some money on the table, as you know. It probably includes an element of security, since Russia under different circumstances might become a more threatening neighbor to some of these republics.

Our motive, of course, is to preserve the non- proliferation regime and to have just Russia as the successor state. Russia's motive is in part the same as ours and also in part a desire to keep control over weapons which it views as its own.

A number of members of the committee made a recent visit to Moscow 2 weeks ago. Based on that visit, during which we spoke with several senior defense people in Moscow, the situation is still very complicated, with differences of views, and the detailed outcome is uncertain.

We clearly have incentives to see those questions settled amicably. For one thing, we have incentives to retain amicable relations with Ukraine, Kazakhstan and Belarus. They are sizeable countries on the borders of a very large country. Even in the new cooperative world order, it is not a bad idea to keep balance of power notions in mind and to have friendly relations with countries on the boundaries of a very large state.

For another, the arrangement that was agreed to at Minsk last December whereby the former Soviet nuclear weapons would be managed by a single military organization. The organization, which is currently headed by Marshall Shoposhnikov, would report to a political structure made up of the four republics. That arrangement is not a bad idea from our standpoint. Structures like that, which in some ways are reminiscent of NATO, can be a very strong deterrent and a very strong defense force. But they are not likely to be swayed into hasty or ill-considered offensive action if political agreement is needed from four separate capitals.

If the continued turnover of nuclear weapons from Ukraine, Kazakhstan and Belarus becomes deadlocked and if it becomes clear that there are motives of money and equity involved in the minds of the republics, we might consider an arrangement whereby the states which turn in enough nuclear material like plutonium and uranium for one weapon would be compensated, for instance by World Bank credits. The World Bank would then—this is my own notion, not that of the Academy—the World Bank might then acquire title to the nuclear material and the nuclear material might be stored in some agreed safeguarded site in a non-nuclear country, for instance, Canada. The weapons could be disassembled and stripped of everything but the nuclear material by Russia, thereby eliminating the classified components. The nuclear material in the course of time could be used as fuel in nuclear reactors. Given present market conditions for these fuels and the present lack of facilities for transforming the metallic plutonium and uranium into reactor fuel, this is a long-term prospect and long-term storage is needed. A decade or more has to be envisaged. Any payment by the World Bank for this material would probably be in excess of the discounted value of the material at present market prices. However, it might not be in excess of this value if you consider that we are heading into a long-term energy shortage and the price of nuclear fuel is to go up in the next century. In any case, the rationale would not be economic so much as security.

As an added twist, the United States and Russia might avail themselves of this agreement, in addition to the other republics. The United States, for instance, if it turned in to this World Bank depository some of its own material, would be reimbursed for some of its contribution to the Bank which is an attractive notion. Russia would be helped in its conversion effort. The mechanism would serve to spread the cost of nuclear weapons reduction more evenly over all the wealthy nations which presumably would profit from a diminution of the nuclear threat. Again, I want to emphasize that this notion, whether it is reasonable or hair-brained, is my own.

Let me turn now briefly, in the rest of my time, to the demand for nuclear weapons and arrangements for dealing with nuclear proliferation. In many people's view, nuclear proliferation is the most important security problem that we face. I am going to summarize my statement, now, in the interest of time. Even though it is a dangerous and in our view unnecessary step, the acquisition of nuclear weapons is surely going to be governed by the laws of supply and demand as is the acquisition of other goods. To date we have been fairly successful in restricting the supply of nuclear weapons, but two things have changed. For one thing, supply restriction will now involve the cooperation of more different countries. The technological tools needed to make nuclear weapons systems have become more widely available. The other thing that has changed is that the demand has changed.

Mr. Reed has noted what makes for nuclear weapons demand and I generally agree with him. There are, of course, internal factors that differ in each country, but three things generally seem to be decisive, at least historically. One is the fear that nuclear weapons may be used against one's own country. I think that fear was probably decisive for President Roosevelt who was facing a race with Hitler to an unknown technology. It was probably decisive for Mao Zedong in China, who was facing both overt and covert threats from the super powers. It may have been decisive for Joseph Stalin.

A second motivation is a desire to influence decisions regarding nuclear weapons and that desire was probably decisive for Great Britain, France and possibly for India. It played a role, I am sure, in Stalin's decision.

The third motivation is the fear of a superior or eventually superior hostile conventional force. That fear was probably decisive for Israel and Pakistan, although not the sole factor. Recent and fairly interesting research indicates that it may also have motivated Mao Zedong, who initiated the nuclear program as he contemplated very heavy Chinese manpower losses in the wake of the Korean War, even though he won his part of it. He is reputed to have noted that, with nuclear weapons, that would not be necessary anymore.

Throughout the cold war, most countries which had some of these fears were securely lined up on one side or the other and with some considerable urging, sometimes, our clients and allies could be urged into the non-proliferation treaty regime. This happened with our principal allies, Germany and Japan. We had considerable discussion about that in the 1960s and with other European countries, and eventually with South Korea and with Taiwan.

During the cold war, believable security guarantees could be given by the United States and the Soviet Union because each had an enemy and other countries perceived that there were good reasons to give the security guarantees. But now things have become much more uncertain and complicated. There are no longer only two centers of power. The European Community, China, and Japan are becoming more autonomous and powerful. The reactions to this new situation with regard to nuclear weapons have varied. Some have been quite favorable. China quite recently acceded to the Non-Proliferation Treaty as a nuclear state and France has stated that it was going to. South Africa has acceded as a non-nuclear state. Argentina and Brazil have decided to end their nuclear rivalry and accept full-scope safeguards even though they are not formally acceding. But other nations, as we know, are going the other way, and Iraq is only one example.

An important factor in determining which way nations are going to go with respect to nuclear weapons is whether they perceive that war is likely for them. Mature nations, the United States, Western Europe, and Japan have given up war as a way to augment their territories or build their nations, but all nations were shaped by war and we have new nations with popular and nationalistic passions and with boundaries that are highly unpopular. It is, I think, unrealistic to expect that war is going to be ruled out of the world. If war threatens, the last 47 years have demonstrated that nuclear weapons are very good deterrents. I believe that the deterrent value of nuclear weapons is going to constitute the bulk of the demand for them among some of these countries.

We have not seen all the dimensions of nuclear deterrence during the cold war. We had nuclear deterrence between the United States and the Soviet Union which were stable, large nations, far away from each other, and which were deterred from taking direct action against each other anyway. But now we are going to see nuclear deterrence possibly exercised in very different situations involving unequal nations, sometimes unstable governments, trying to maintain local freedom of action, as Mr. Reed pointed out, and viewing nuclear weapons as an equalizer.

I think we have to address this demand. I think it will not be enough to address supply measures. In order to address demand, we are going to have to go to the root of the security problems for the nations involved, which is a difficult political thing to do.

In closing, I will say a word about the cooperative world orders which are being studied and discussed by a number of groups and people around the country. Some important studies have come from the House Armed Services Committee and its chairman. Foundations and academic researchers are looking at the question as are, of course, agencies of the Government.

There are a lot of detailed questions that are being studied, but in addition to the detailed questions, there is a question of what kind of cooperative world agreement might work to try to address both supply and the demand for nuclear weapons. Of course, I do not know the answer to that question, but I think it is fair to say that we have not faced up to some of the key issues yet. I will mention a couple of them. One is that, if there is to be lasting collaboration on the goal of nuclear non-proliferation and the security that goes with it, if we agree, for instance, to restrict trade in nuclear materials, advanced weapons, components, technologies to nations that abide by a strengthened respected regime, that abide by regional arms limitation, that maintain a register of trade in all relevant goods, nuclear weapons and others—that is a good idea, but a proposal like this would have to have priority over other political objectives if it is going to work.

For instance, if China were a member of this arrangement, and it would have to be, then China or any other cooperating nation would have to have the equivalent of most favored nation treatment in some key areas of technology and trade involving security, even though they might do things like Tiananmen Square which we did not approve of.

If Iran, Vietnam or North Korea were part of the agreement—and we would want them to be—again they would have to participate in the benefits of the agreement as applied to security and trade in important goods.

Japan, of course, has been a leader in restricting arms trade and would be a necessary part of any arrangement to restrict arms trade and arms technology trade in the future. But then, the benefits of the arrangement with regard to Japan would have to take priority over any future sectoral trade retaliation in these areas.

In other words, a universal arrangement governing nuclear security would be essentially a policy declaration that we are going treat nuclear proliferation and security the same way that we treat such things as communicable disease, international crime, air traffic and the rest, as a priority item on which nations cooperate and get the benefits from cooperation regardless of other differences. I am not sure we are ready to do this and I am not sure other participants that would be needed in the arrangements are ready to do this.

Another unresolved issue concerns the use of force to support this regime and there I only have questions, I do not really have any answer. Namely, whose force would it be? Under what criteria would it be used? Under whose political authority?

Clearly, if there is going to be a cooperative international regime to prevent nuclear proliferation as best we can and to contain wars, these questions have to be answered. So defining a process for reaching agreed answers is the next pressing task. While I believe that Russia and China must be involved and will be an important part of the arrangement, I think that we are going to have to continue to rely mostly on our democratic allies. I think that democracy and a rational approach to economic welfare have been the major driving forces for peace all over the world. They are likely to continue to be. It is a very uneven process, but we have seen it work in regions as diverse as Spain, Central Europe, South Africa to a degree and South Korea in the last 10 or 20 years.

So in conclusion, I will mention three brief points. One is that we are going to see some wars and probably some nuclear proliferation. They cannot all be prevented. Two, we can limit the danger from these developments by means of security and economic incentives, by means of deterrence and by means of containment. But these all require cooperation among the major world powers such as we have not seen to date. Working out the terms of this cooperation is a very important task and the next task. Third, I believe that demonstration of the workings of democracy and economic health are going to be the main tools in the long-term for turning nations away from war as a nation-building tool and turning former enemies into allies and customers and probably competitors, too, but we can probably deal with that.

Thank you, Mr. Chairman.

PREPARED STATEMENT OF MICHAEL MAY

Mr. Chairman, members of the committee, thank you for inviting [redacted] to testify here today.

In my testimony, I will attempt to do four things:

1. Briefly summarize the conclusions reached by a National Academy of Sciences study of the U.S.-Soviet nuclear relationship issued last fall, with emphasis on what has happened recently and what is still valid.
2. Review and comment on the current nuclear weapon situation in the former Soviet Union, the Commonwealth of Independent States.
3. Discuss factors which may drive nuclear proliferation today.
4. Suggest an approach to some of the problems occasioned by nuclear weapons in our New World order.

The National Academy Study. The Committee on International Security and Arms Control is a standing committee of the National Academy of Sciences which has been interacting with Soviet—now Russian—scientists, political scientists and military officers for nearly 10 years. The committee includes scientists with nuclear weapons and arms control officials, former military officers and political scientists. In early 1990, in view of the changes of the previous 5 years, the committee started a study of the nuclear relationship between the United States and the then Soviet Union with a view to seeing how it might change. The study was completed and released in early September 1991, a little before President Bush's now historic proposal for deep cuts and pullbacks in nuclear weapons and President Gorbachev,s positive response in October.

Briefly the study foreshadowed what has since been happening. It recommended bilateral cuts in strategic nuclear weapons, predicated on a successful START experience, to about half the START level; bilateral cuts in tactical nuclear weapons, in concert with our NATO allies, to a still lower level; elimination of tactical weapons on surface ships and, again in concurrence with the allies concerned, of ground-based tactical nuclear weapons outside the United States. It also recommended specific improvements in command and control of nuclear weapons.

For some years studies had come to the conclusion that numbers of nuclear weapons systems exceeded targeting requirements. In fact, the number of nuclear weapons was based on a level of deployment of missiles, bombers and submarines established in the Eisenhower administration. The political and technological dynamics since that time—such things as MIRVs and cruise missiles—led to ever larger numbers of weapons, numbers far in excess of those which had seen us through the worst days of the cold war, on both sides of the Iron Curtain. The removal of that curtain by President Gorbachev and the withdrawal of Soviet forces from Central Europe made it possible to reduce the numbers to a much more economical and justifiable level.

All this is now accepted by the civilian and military leadership in both the United States and Russia. Three additional points were made in the study which it may be useful to note here.

First, cutbacks, even very deep ones, do not mean an end to the need for occasional modernization. In particular, the nuclear weapons systems must remain invulnerable to attack in whatever state of alert or non-alert they may be if they are to constitute a deterrent to future rash or aggressive actions rather than an invitation to such actions. Invulnerability is the more important, the lower the numbers go. Modernization will also be needed to maintain and improve standards of safety and security.

Of course, the present Russian leadership does not seem likely to take aggressive actions, but they still have nuclear weapons. In addition, the nuclear force policies we lay down now are likely to govern decisions for some time to come. Nuclear deterrence is aimed at preventing aggressive actions on the part of actors who may be very differently oriented from those now in power, in Russia or elsewhere. Nuclear deterrence may also play a political role in preventing potentially dangerous demagogues from coming to power at all. If nuclear forces are to play this role, they should meet the standards of invulnerability, operability, safety and security required of any deterrent force.

This being said, it is clear that, for some time to come, we can rely on existing systems, selecting for elimination the more obsolete and vulnerable among these systems. The rate and cost of modernization can go down considerably, and has in fact done so already. The numbers given above are also not the lowest possible. They were chosen as levels that could be reached by bilateral agreements between the United States and Russia. The study also pointed to levels of 1,000 or fewer as appropriate when reliable security cooperation and arms control agreements could be attained among all the world's nuclear and potential nuclear powers. A pattern of reliable security cooperation is needed, not just formal agreements. Decisions about nuclear weapons cannot be divorced from other security considerations, either for the United States or for other powers, a point to which I will return when considering the causes of nuclear proliferation.

Second, [illegible] nuclear weapons systems go off alert on both sides, and as Russia evolves from an enemy to a nation we have normal relations with, target selection no longer plays the role it once did, when many of the systems were ready to go at minutes' notice, and when their purpose was well-defined. Comparisons of numbers of nuclear weapons systems with numbers of military plants or military bases in Russia and elsewhere become somewhat idle. The size of the nuclear forces is likely to be set by other factors, such as the need to retain leverage over the world's nuclear powers, particularly with [illegible] view to agreed reductions, and consideration of the overall potential to threaten the United States in a way that might be deterred by nuclear weapons. Rather than being targeted against specific objectives, nuclear weapons systems may be held in reserve much as other elements of our forces are.

Third, while the acquisition and deployment of nuclear weapons cannot be divorced from the overall security situations, the security situation, the National Academy committee came to the conclusion that U.S. security would be best served if nuclear weapons served no purpose other than to deter the use or threat of nuclear weapons by others. Now, of course, that is not entirely up to us. If some very major, but non-nuclear threat, such as the threat Stalin posed in Europe, were to arise again, nuclear weapons would presumably again play some role in deterring it, whether we planned it or not. But it is not in the U.S. interest, we believe, to keep nuclear weapons in the forefront of our deterrent posture, or of our military plane. The existence of nuclear weapons does not fundamentally help the United States. On the contrary, it makes the United States more vulnerable than it would otherwise be. This is true as well of other rich, developed countries, and there is a consensus among most of them that nuclear weapons should be deterrents of last resort, not to be used or threatened except to deter their use. We believe that strengthening this consensus is a major national interest of the United States, not to be sacrificed lightly. A little later in this talk I will discuss in what ways the consensus against the use of nuclear weapons may be strengthened.

Nuclear weapons in the CIS. As members of this committee know, the United States and Russia are now engaged in a cooperative effort to retrieve nuclear weapons from the other CIS republics where they are still stationed, namely, Ukraine, Byelarus and Kazakhstan. The nuclear weapons elsewhere, Eastern Europe, the Baltic republics and the Transcaucasus, have already been returned to Russia according to CIS authorities. All remaining tactical nuclear weapons are to be returned by July 1 of this year, strategic weapons by 1994. The republics, except Kazakhstan, have agreed to this in principle, although President Kravchuck of Ukraine recently said he was holding up transfer in order to ensure the weapons are destroyed.

While the National Academy committee did not of course foresee the details of the breakup of the former Soviet Union, it did foresee that, if the breakup occurred, the successor government to the Soviet Union might well wish to continue reductions and to seek cooperative security arrangements with the U.S. and European states. This is what is happening. I would like to comment on two aspects of this process.

The first is that the agreements beyond START are informal. Both ratification of START and clearly codified agreements beyond START are needed if we are to proceed without the doubts and questions on both sides that could otherwise poison the relationship. We do not know who the future leaders of Russia will be, nor what pressures they will be working under. True, it is in the interest of both the United States and Russia to limit the danger from nuclear weapons from each other and from elsewhere. Neither needs nuclear weapons to be powerful. Both are more vulnerable to nuclear weapons than to any other military measures. There is thus a strong basis for cooperation on this subject between the two countries, formal agreements or no. This cooperation would have to do with verification, warning, command and control, safety and non-proliferation.

These basic argument may however be overlooked at times, particularly [illegible] future Russian leaders deal with nationalist pressures and possibly with resentment over Russia's temporary slide back from its earlier status. It is to our advantage, I think, to nail agreements down as clearly as possible, and to develop a constituency within the military and civilian establishment for working out modes of cooperation in nuclear matters.

Some may argue that informal arrangements may serve our purpose better because we may not want to settle for the formal equality in numbers which formal arrangements would surely require, or because we may want to retain excess nuclear weapons for some later military purpose. These arguments would in my opinion be misguided. Adequate numbers of nuclear weapons should be provided for openly in the agreements. As for superiority, the United States will continue in the future to derive a meaningful military edge from the same two sources from which it has derived it in the past: Adequate capacity to generate capital, for purposes of both domestic prosperity and influence abroad, and the best possible military technology, whether nuclear or conventional. Excess nuclear weapons is the least important dimension of defense capability, and we should not lose the ability to work cooperatively with Russia, which is bound to remain a great power in the long term, over such an issue.

The second aspect of the process which I will comment on is the bargaining over nuclear weapons that is now going on among the republics, Russia and the United States. The motives on the republics' side probably include domestic political appeal in certain quarters, desire for money, some of which the United States has put on the table, and probably an element of security, since Russia, under different circumstances, might be their most threatening neighbor. Our motive is to preserve the non-proliferation regime. Russia's is in part the same, in good part the desire to keep control over weapons it views as its own. Based on our recent visit to Moscow (3/23–28), the situation is still complicated and the detailed outcome uncertain, with different people holding different views.

We have incentives to see questions involving Ukraine, Byelarus and Kazakhstan settled amicably, beyond the general advantage of settling everything amicably. For one thing, these are medium-sized states on the boundaries of a very large state, and it is not a bad idea to have friendly relations with such states, even under the new cooperative world order. For another, an arrangement where the former Soviet nuclear weapons would be managed by a single military organization reporting to a cooperative political structure made up of the four republics, as was agreed at Minsk last December, would not be a bad idea from the standpoint of stability. Such structures, as evidenced in NATO, can be strong deterrent and defensive forces, but are not likely to be swayed into hasty or ill-considered offensive actions. Again, I am thinking of the long-term future when I say this, not of the present leadership.

If continued turnover of nuclear weapons from the non-Russian republics does become deadlocked, and it becomes clear that there are motives of both money and equitable treatment involved, we might consider an arrangement whereby states which turn in enough nuclear material for a weapon would be compensated, say by World Bank credits, with the Bank acquiring title to the material, and with the material stored in some safeguarded site in a non-nuclear country, such as Canada. The weapons could be disassembled and stripped of everything but the nuclear material by Russia. The nuclear material could eventually be used as fuel in nuclear reactors, but, given the present market conditions and the present lack of facilities for making fuel suitable to the most common types of reactors from metallic plutonium and uranium, long-term storage must be envisaged. Any payment by the World Bank would probably be in excess of the discounted value of the material at present market prices, but perhaps not at the prices one might anticipate if we are heading, as some say we are, into a lengthy period of energy shortage. In any case, the rationale would have to be ascribed to security rather than economics.

The United States and Russia could avail themselves of the agreement for some of their nuclear weapons. The United States would thereby be reimbursed for some of its contribution to the Bank, Russia would be helped in its conversion efforts, and the cost of nuclear weapons reductions would be more evenly over all the wealthy nations that presumably would profit from a diminution of the nuclear threat.

The demand for nuclear weapons. In the view of some, nuclear proliferation is our most important security problem and warrants measures, such as the bombing of countries that have not engaged in hostile actions, which may jeopardize other aspects of our security arrangements. I would like in the next few minutes to give a perspective on the problem, and to suggest a policy approach.

The acquisition of nuclear weapons may be a dangerous and unnecessary step in our view, but nevertheless it is governed by the laws of supply and demand, as is the acquisition of other goods that seem to us dangerous and unnecessary such as drugs or assault rifles. To date, we have been fairly successful in restricting the supply of nuclear weapons, but two things have changed. One is that supply restriction will now involve the cooperation of more countries as the technological tools needed to make nuclear weapons systems become more widely available. Another is that the demand for nuclear weapons has changed.

What makes for nuclear weapons demand? There are internal bureaucratic factors which differ in each country, but three things, singly or in combination, seem to be decisive. One is the fear that nuclear weapons may be used against one's own country. That fear was probably decisive for Roosevelt facing a race with Hitler for a yet unknown technology, for Mao Zedong facing overt or covert threats from both superpowers, and perhaps for Joseph Stalin. A second is the desire to influence decisions regarding nuclear weapons. That desire was probably decisive for Great Britain and France, and possibly for India and the Soviet Union as well. The third is fear of a superior, or an eventually superior, hostile conventional force. That fear was probably decisive for Israel and Pakistan, though not the sole factor. Recently research indicates that it motivated Mao also, as he contemplated Chinese losses in the wake of the Korean War, despite the fact that he achieved his purpose.

Throughout the cold war, most countries that had hostile neighbors or could fear great power intervention were securely lined up on one side or the other. With sometimes considerable pressure, clients and allies could be urged into the Non-Proliferation Treaty. This happened with Germany and Japan, with the other European countries, eventually with South Korea and Taiwan. Believable security guarantees could be given by the United States or, as the case might be, the Soviet Union.

Now, things have become more uncertain and complicated. There are no longer obvious reasons for some of the old alliances and security guarantees. There are no longer only two centers of power, as the European Community, China, Japan become more autonomous or more powerful. The reactions to this new situation as regards nuclear weapons have varied. China acceded to the Non-Proliferation Treaty as a nuclear state, and France has stated that it will do so. South Africa has acceded as a non-nuclear state, Argentina and Brazil have decided to end their nuclear rivalry and to accept full-scope safeguards on their nuclear activities. Other countries are going the other way.

An important factor for determining nuclear weapons demand is the perceived likelihood of war. Mature nations such as the Western European nations, the United States and Japan may have given up on war as a method of nation-building and defining borders. But most nations were shaped by war. Popular nationalistic passions may be of recent date, and may be a transient on the world stage, as some tell us, but many peoples, in the Middle East, in Africa, in South Asia, in Eastern Europe and the former Soviet Union, are still in building their nations and prey to these passions. In some cases, the citizens of the nations affected are sufficiently aware of and committed to the modern world of economic development and liberal political order to give up on whatever territorial and psychic advantages war may be thought to bring. Perhaps this has occurred with respect to Ukraine and Russia, for instance. In some other areas, this is obviously not the case. Where war is deemed possible, threats to vital interests are also possible, and there will be at least a potential demand for the ultimate deterrent, nuclear weapons.

The last 47 years have demonstrated one thing about nuclear weapons, namely that they are good deterrents. We tend to worry about nuclear terrorism, especially in connection with governments that have used terrorism. Terrorism is a threat which we must take seriously, but the bulk of the demand for nuclear weapons is likely to come, I believe, because of the deterrent value of these weapons, rather than for terrorist purposes.

We did not see all the dimensions of nuclear deterrence during the cold war. Both the United States and the Soviet Union were stable, large, distant nations, and nuclear deterrence simply reinforced other kinds of deterrence. It would have been difficult if not hopeless for either nation to invade the other, for instance. We may now see very unequal and sometimes unstable nations in possession of nuclear deterrence and using it to maintain local freedom of action. Nuclear weapons may seem to a smaller and isolated nation to be an equalizer, a guarantee of non-interference by great powers, as well as a deterrent to perceived local threats.

I have emphasized demand because, in the long run, demand determines what happens. Even with the best of cooperation among all participants in the non-proliferation regime, and perfectly consistent U.S. non-proliferation policies, neither of which has occurred to date, supply can only be partially and temporarily controlled if the demand is strong enough. The demand cannot be ended by force. Most of our fellow participants in the non-proliferation regime will not use force except under very clear and immediate provocation, such as the invasion of Kuwait provided. The United States may lead, but it cannot go it alone against all the nations in the world which it suspects of harboring a nuclear weapon program, or even some number of them. If it did, it would soon find itself isolated and the object of concerted counteractions from the world's other major powers. We and our partners in wanting a stable world must work on the demand, as well as the supply of nuclear weapons.

Nuclear weapons policy. There are many attempts going on now to see what should be done about nuclear weapons in our New World. Some important ones come from the House Armed Services Committee and its chairman. The foundations and their academic researchers, the academies, such organizations as the Union of Concerned Scientists, and many others are tackling various aspects of the problem.

There are also studies going on within the administration or sponsored by agencies of the Government, such as the one presented by my colleague here Tom Reed.

Some of the studies take on one or another important piece of the problem: What should be done about our future nuclear weapons deployments? What should be done about the former Soviet nuclear laboratories? What should be done about the suspect facilities in North Korea? What should be U.S. policy toward the emergent strategic entity in Western Europe? How to strengthen the inspecting and reporting functions of the International Atomic Energy Agency, so that it can reliably assess nuclear weapons programs wherever they may exist? Others take on the task of looking at the whole world order and trying to deduce a feasible and yet adequate U.S. policy.

On the whole, it is fair to say that we as a body politic have not made up our collective mind about some of the key issues. One such issue is, how far are we and other nations prepared to cooperate on the goal of nuclear non-proliferation, and more generally of security. It is being suggested, for instance, that the major nations and as many others as possible agree to restrict trade in nuclear materials, advanced weapons, components and the broad range of associated technologies, to nations that agree to and abide by a strict, inspected nuclear non-proliferation regime, regional arms limitations, and maintenance of an international register of trade in all relevant goods. This I think is a good idea, in principle. The demand for nuclear weapons is tied to the status of conventional threats and the supply, to trade in various technical goods, so they all should be considered together if we are to do something about demand as well as restrict supply.

Nevertheless, a proposal like this forces us to think about the priority such an arrangement would have to have in order to work. If China were part of the arrangement, and it would have to be, then China and any other cooperating nation would have the equivalent of Most Favored Nation treatment in some key areas of technology and trade, even if such incidents as Tiananmen Square were to recur, and I think we know that they are bound to recur, if not in China, elsewhere. If Iran or Vietnam or even North Korea were part of the agreement, and we surely would like them to be, then they would have to be included also in such trade, to the extent that generally applicable criteria provided for it. Japan has been a leader in restricting arms trade and would be of necessity part of the arrangement. The arrangement would have to take priority over any future sectoral trade retaliation in key areas.

In other words, a universal arrangement governing trade in nuclear and advanced military technologies and goods would amount to treating nuclear proliferation and security the same way the world community treats communicable disease, or international crime, or air traffic, namely as priority items on which nations cooperate and get the benefits from cooperation regardless of political or economic or religious differences. We should consider whether we, and other necessary participants, are ready for this.

Another unresolved issue concerns the use of force to support the anticipated non-proliferation and security regime. The United States is fresh from winning a war in a very one-sided manner. It is a temptation to believe that we can win other wars as easily. Yet we know all wars are different, none is predictable, and, in President Eisenhower's words "none of them ever settle anything." They are instruments of last resort. Still, force may be needed some time. Whose force? Used under what criteria? Under whose political authority and military command? We can think of answers to those questions, but the answers must be acceptable to at least a majority of the world's nations, including the several most powerful ones.

As a result, defining a process for reaching agreed answers is the next pressing task. While this process must include Russia, China and others, in my view our best long-term allies are going to remain the democracies we have been allied with all along. We will continue to have differences with them over how we compete economically, but democracy and a rational approach to economic welfare have been the major driving forces for peace in all regions of the world, and they are likely to continue to be. They work by turning people away from war as a means of self- or group fulfillment. We have seen them work in that direction over the past 20 years in regions as diverse as Spain, Poland, South Africa and South Korea.

I am led to three conclusions. One, we are going to see some wars and some nuclear proliferation—they cannot all be prevented, by force or otherwise. Two, we can limit the danger by means of security and economic incentives, deterrent forces and economic containment, but these require a cooperative world order among the world's principal powers and as many others as possible. Working out the terms of this cooperation is the next task. Three, in the future as in the past, a demonstration of democracy and economic health will be the main tools of security, as it will turn former enemies into allies, customers—and probably competitors too, but if we get our act together, I am convinced we can deal with that feature as well.

THE FUTURE OF THE U.S.–SOVIET NUCLEAR RELATIONSHIP

Committee on International Security and Arms Control

National Academy of Sciences

EXECUTIVE SUMMARY

The remarkable political changes in the Soviet Union and Eastern Europe call for a fundamental revision of U.S. nuclear policy, which for the past 45 years has been principally focused on the containment of the Soviet Union. The Soviet Union retains formidable conventional forces, but the Soviet military threat has receded, and the danger of a surprise Soviet conventional attack in Europe has virtually disappeared, given the demise of the Warsaw Pact, the unification of Germany, the ongoing withdrawal of Soviet forces from Central and Eastern Europe, and Soviet preoccupation with internal affairs. Moreover, while the Soviet Union still has an immense nuclear arsenal that could devastate the United States, the likelihood of such an attack, always remote, seems to have diminished even further.

Despite major uncertainties about the outcome of current internal Soviet developments, the reduction of the Soviet military threat to the United States and its allies is likely to continue in the near future. Repression, conflict, or disintegration within the Soviet Union would present immensely difficult political problems for U.S.-Soviet relations. Such developments alone, however, would not restore the NATO-Warsaw Pact confrontation that drove postwar nuclear planning on both sides, justifying immense arsenals and nuclear forces poised for immediate response. The disappearance of that confrontation and the unification of Germany have transformed the security landscape almost irreversibly. Even if the Soviet Union reverts to a centrally controlled authoritarian regime, such a government would likely be too preoccupied with internal problems to engage in external aggression. Beyond this, the future Soviet Union, or any successor government with control over its nuclear weapons, may well wish, for reasons of cost, security, and diplomacy, to continue reducing the nuclear arms competition with the United States and to seek some level of cooperative security arrangement with the United States and the new European community.

In the face of these uncertainties, we believe it is possible and desirable to seek a new nuclear policy, with appropriate hedges against unanticipated adverse outcomes. The challenges to the United States lie in developing policies and procedures that would encourage any future Soviet leadership to continue engaging in actions that would reduce military expenditures, increase international stability, and encourage joining with the West in a variety of cooperative ventures.

The reduced Soviet threat and political changes in Eastern Europe have further decreased the already declining European willingness to rely on nuclear weapons for defense. European governments are actively seeking a new organizational framework involving some level of cooperative security, probably including a measure of joint management of nuclear weapons. Joint management would serve to reduce incentives for proliferation and further constrain the role of nuclear weapons to that of ultimate deterrent.

In East Asia the situation is not as clear, and there is more potential for nuclear arms competition and proliferation. Opportunities exist, however, to reduce the risks to regional security. These could extend to cooperation with China on command and control problems, enhanced cooperation on security and safety measures for nuclear weapons, and broadened agreements on verifiable deployment and exercise restraints. Taking advantage of these opportunities will also require careful attention to sustaining United States-Japanese cooperation in security matters.

Conflicts involving major U.S. interests remain possible in many parts of the world. The danger of nuclear proliferation in unstable areas may increase. The increased commercial availability of the advanced technologies supporting nuclear weapons and their delivery systems has now put nuclear weapons technically within reach of a growing number of developing countries, as well as all of the major industrial nations. Successful efforts to control nuclear proliferation will require reducing the political demand for nuclear weapons as well as much more effective efforts to control the supply of the specific technologies.

While defenses against nonnuclear tactical missiles are, under some circumstances, feasible and desirable, United States and Soviet strategic nuclear missiles continue to have an advantage over any defenses thus far considered. This study assumes no strategic antimissile systems beyond the minimal capability permitted by the Antiballistic Missile (ABM) Treaty.

Under these circumstances, some of which are new and some of which represent a continuous evolution over the past several decades, we believe that the security of the United States will rest to a large degree on cooperation measures involving other countries. We believe this is especially true for nuclear weapons. We conclude that the principle objective of U.S. nuclear policy should be to strengthen the emerging political consensus that nuclear weapons should serve no purpose beyond the deterrence of, and possible response to, nuclear attack by others.

In judging future requirements for nuclear weapons, one must avoid both the conclusion that acquiring more weapons is always more "conservative" and the conclusion that reducing the number of weapons is always more "stabilizing."[1] Instead, we seek an appropriate balance between the positive and adverse effects of nuclear weapons in the face of many uncertainties. We recommend, in furtherance of a new nuclear policy, that:

(1) In the agreements that follow the Strategic Arms Reduction Treaty (START), the United States and the Soviet Union should reduce the number of nuclear warheads in their strategic forces to 3,000–4,000 actual warheads, a reduction of as much as a factor of 3 below anticipated START levels. The remaining strategic forces of both sides should be made more survivable, both by eliminating the most vulnerable forces (in particular MIRVed ICBMs) and by reducing the vulnerability of retained forces. To these ends, agreements should be crafted so that both sides are permitted to develop more survivable, less threatening systems and are discouraged from retaining or building systems that do not meet these criteria. Concurrently, U.S. tactical nuclear forces based in Europe should be reduced by an even larger factor or eliminated entirely in coordination with U.S. allies. Nuclear weapons should also be removed from surface ships.

(2) As world conditions permit, the United States should seek further reductions in the number of nuclear warheads in U.S. and Soviet strategic forces. The nuclear forces of all other nuclear powers should be included in these reductions as well. The appropriate new levels cannot be specified at this time, but it seems reasonable to the committee that U.S. strategic forces could in time be reduced to 1,000–2,000 nuclear warheads, provided that such a multilateral agreement included appropriate levels and verification measures for the other nations that possess nuclear weapons. This step would require successful implementation of our proposed post-START U.S.-Soviet reductions, related confidence-building measures in all the countries involved, and multilateral security cooperation in areas such as conventional force deployments and planning.

(3) As part of any agreements that follow START, the United States should seek to incorporate procedures to totally destroy the nuclear warheads associated with reduced strategic systems. Initially, either the entire warhead or preferably the contained fissionable material could be placed in secure monitored storage. As a separate initiative, the United States should seek to negotiate agreements with the Soviet Union to ensure that additional fissionable material would not enter the weapons cycle from new production or the nation's peaceful nuclear program.

(4) The United States should continue to improve the survivability and reliability of the nuclear warning, communication, command, and control system regardless of how many nuclear warheads are retained. Progress in these areas requires improved hardware and software, increased transparency between the United States and the Soviet Union, decreased reliance on destroying time-urgent targets, and assurance that even partially destroyed forces can threaten the minimum set of targets essential for deterrence. Specifically, to improve command and control, the United States should install permissive action links (PALs) or equivalent devices on all sea-based nuclear weapons, including sea-launched ballistic missiles (SLBMs). At the same time, the United States should encourage other nuclear powers to install PALs in all their forces. A continued effort should be made to review and improve these systems and the human and electronic organizations operating them.

(5) With respect to Europe, the United States should continue to support the evolution of cooperative security arrangements. NATO can still play a useful role, but the United States should encourage the creation of a broader European organization, which would not exclude any major regions, for the purpose of achieving more lasting security cooperation, including cooperation in the nuclear field. Such an organization could serve the following purposes:

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[1] As used in this report in reference to nuclear weapons, the term is restricted to what is commonly referred to as "crisis stability." This designates the condition under which the ability of a nation's forces to deliver "unacceptable" retaliation is not impaired by being struck first by an opponent's forces.

- improving transparency among the present nuclear states regarding deployments, safety, command and control, and warning systems affecting possible nuclear threats inside and outside Europe;
- reviewing plans for any new nuclear system, upgrade, or deployments, or any increase in the levels of systems, and making recommendations regarding these plans to the appropriate political body;
- preparing to participate in the next reduction negotiations between the United States and the Soviet Union; and, eventually,
- providing for some measure of joint management of the nuclear forces remaining in Europe, including those of Great Britain and France under agreed political auspices.

(6) Sustained U.S.-Japanese cooperation on security is crucial to limit both security threats and nuclear proliferation in East Asia. Accordingly, despite economic rivalries, attention to continuing this cooperation deserves high priority. Beyond this, prospects for regional cooperation in East Asia are more uncertain. The groundwork should be laid now for cooperation in nuclear matters among concerned countries, including the four major powers in the region (Japan, China, the United States, and the Soviet Union), each of which has independent sources of strength and its own security agenda. The United States should seek cooperative efforts with the powers concerned on:

- security and safety measures,
- command and control, and
- declaration and verification of present deployments and future plans.

(7) The United States should continue to give high priority to efforts to prevent the further proliferation of nuclear weapons. Emphasis should be given to decreasing the demand or incentives for proliferation as well as to limiting the supply of technology. The United States should take the lead in supporting international efforts to:

- strengthen the existing Nonproliferation Treaty (NPT) regime by augmenting the safeguards required of treaty signatories on their own programs and on the programs of countries to which they export materials and equipment;
- strengthen existing international agreements restricting technology applicable to nuclear weapons programs and related delivery systems and, where necessary, negotiate new ones;
- promote parallel declarations by all nuclear weapon states that they will not use or threaten to use nuclear weapons against nonnuclear weapon states in any circumstances and that their nuclear weapons serve no purpose beyond the deterrence of, or possible response to, the use of nuclear weapons by other nuclear weapon states; and
- support regional arms control efforts aimed at limiting arms races and local security threats.

Mr. SPRATT. Thank you very much, Mr. May.

Mr. Kyl.

Mr. KYL. Mr. Chairman, I appreciate your yielding. I have a 3 p.m. meeting and I would like to make a couple of very brief comments. I have just a couple of brief questions.

First of all, I really appreciate the testimony of both witnesses. I think it is very helpful. In the book, "The Future of U.S.-Soviet Nuclear Relationships"—on page 39—there is a reference to something that I hear a little bit about on the Hill. A concern that when the future duration of the NPT is addressed at the 25th Anniversary Review Conference in 1995, lack of progress on a test ban could jeopardize extension of the treaty. It is then said in the book, "In the final analysis most countries will make their decisions about the utility of the NPT regime or their maintenance of a nuclear option on the basis of their perceptions of their own security interests, not on the actions of the United States and the Soviet Union or other nuclear weapons states on testing."

Mr. May, does that reflect your personal views as well?

Mr. MAY. Yes, it does.

Mr. KYL. Mr. Reed?

Mr. MAY. I personally believe that. That last paragraph I wrote myself and reflects my views.

Mr. KYL. Mr. Reed?

Mr. REED. I was not a member of Dr. May's panel, but I very much concur with that. That those decisions, what is done about the NPT, will be done by each country's perceptions of their best interest.

Mr. KYL. You may both be aware that close to 200 Members of Congress have signed on to a bill which would provide for a 1-year moratorium on U.S. nuclear testing. I gather from your comments that both of you would find that troubling and would agree that we do need some level of testing as long as we have a nuclear deterrent. Is that correct?

Mr. MAY. Yes, I would subscribe to that personally, now. Opinions were divided on the committee about the nuclear testing. The committee is composed of people ranging from former Deputy Head of the Arms Control Agency under President Carter, to former Under Secretary of the Air Force and a former Chairman of the Joint Chiefs. We had a variety of views and on this particular issue, views were divided, although on the main conclusions, the committee was unanimous.

Mr. KYL. Mr. Reed?

Mr. MAY. My view is that as long as we have these gadgets we are occasionally going to need to test them. They are pieces of hardware like other pieces of hardware and you cannot avoid that.

Mr. REED. Mr. Kyl, my views were that a moratorium—I did nuclear weapons design once. I was there during the moratoria of 1958 to 1960, that is the same thing as a test ban in terms of its impact on the systems, and I think that would be very counterproductive.

Mr. KYL. I appreciate that.

A final comment. Dr. May, one of the things you have said is in fact the deeper we cut nuclear weapons the more we need to be concerned about modernization and invulnerability. It seems to me that it follows—both of you said you would, or I think you said you would, address this later if we got into it. It follows that strategic defenses can play an ever more important role the deeper you cut offensive nuclear weapons. Is that generally an accurate statement in your view?

Mr. MAY. My own view is that we do not have a strategic defense system that I would care to see deployed. That is my own technical assessment of the situation.

I could go into some detail about that. Basically I think that for the purposes that we are thinking about, unauthorized launches, accidents, or Third World threats against domestic targets here—it seems to me that a defensive system is not going to be effective or any defensive system I have seen at any reasonable cost. This is a technical appraisal, not a policy appraisal.

I feel differently about tactical defenses, defenses of fleet units, of air bases in force projection areas. But strategic defenses, I do not think we are there, yet, although I have always supported research in the area.

Mr. KYL. Mr. Reed.

Mr. REED. I think that defenses very much complicate the matter when you talk about large strategic forces. I agree that tactical defenses are important. I guess my technical assessment of the progress of defenses against Third World threats in particular is different than Dr. May's. I think that a space-based limited defense to deal with the Third World problem will work. It is a difficult technical challenge, but so are a lot of other things and it is terribly important to deal with the Third World threat.

Mr. KYL. I really appreciate both of your views on these important subjects and I think you have added a lot to my understanding and I apologize for having to leave.

Thank you very much, Mr. Chairman, for your indulgence.

Mr. SPRATT. Mr. Bennett, do you have any questions, sir?

Mr. BENNETT. I do not.

Mr. SPRATT. Secretary Reed, you said in your testimony, the core of it, that you saw a need for approximately 5,000 nuclear weapons, plus or minus 20 percent. But you also said that you looked upon this as sort of an interim number in the sense that you said you hoped this would be a way station on the way to a safer and more secure world.

I take that to mean that intrinsically you think 5,000 nuclear weapons is too many. All things being equal, if we live in a safe and more secure world, if we were certain about the course of the CIS or Russia that we might opt for fewer than 5,000 weapons and feel safer and more secure if we did. In any event, I seem to sense a caveat after the prescription of 5,000 in your testimony.

Mr. REED. Thank you, Mr. Chairman.

I most certainly would like to see reduced numbers. The caveat was that the current purpose of large numbers of U.S. nuclear weapons are to deter those who control or could come to control the Soviet, the debris from the Soviet empire. Today, given what is there and given the lack of any substantial evidence of massive dismantling of those things that seems a reasonable number.

I would hope very much that. In fact, the second role of what I see as the major role of weapons is to act as bargaining chips is that we can agree with the Russian government to begin to back off from those numbers and to downsize the forces in some reasonable way. I have no problems with the numbers that Dr. May gave as goals as to where we might go in the world. I suppose our disagreements, if any, is that I see history as tides, tides in the affairs of men. Currently, the tide runs in the direction we want and we should take advantage of it. But there is no end game in arms control.

Mr. SPRATT. If the tide continues from the Soviet Union, excuse me, the Commonwealth of Independent States, and if Russia, in particular, consolidates all of the nuclear weapons from Kazakhstan and Ukraine and then begins to systematically retire them so that the numbers steadily diminish, and the political situation stabilizes—then you see the driver for the 5,000-plus or minus 20 percent prescription driving in the other direction. You see that number reducing possibly to the level of 1,000 or 2,000, as the NAS recommended?

Mr. REED. In your list of caveats, the important one is that there is some tangible agreement to commence disassembly of forces, removing SS–18s from silos, for instance—I clearly would like to see us drop to lower numbers.

Mr. SPRATT. Now, let me ask you both, in terms of disassembly, particularly on their side, but I think there will be some reciprocity expected on our side. What should we be seeking in the way of dismantlement and disassembly and destruction or transmutation of the fissile materials in these warheads? Dr. May.

Mr. MAY. That is a subject in which there is a lot of detailed study going on now and I am not up to date on all of it. So I would suggest that some laboratory witnesses would give you important added details which I cannot give you.

Clearly, you are dealing with a couple of contending factors. On the one hand, both we and Russia want to retain secret knowledge to ourselves which might lead to a larger vulnerability of these things. That has to do with the electronic package, that has to do with the way the high explosive is wrapped around, and it has to do with detailed shapes.

So there is probably going to be part of the dismantlement on both sides where the states involved themselves would be doing the job the way they think best. There will be some units coming in from the field at one end, and that could be monitored under U.N. auspices. I do not see any problem with that, and that would be, in fact, to our advantage to do that because then we would know what the other side is doing.

Then at the other end, you get a certain quantity of plutonium and uranium. We do not have to—to my mind—give away the exact number of kilograms of each per weapon. We can just strike some rough average which you can do on the basis of general physics and say, well, we expect x kilograms of plutonium and x kilograms of highly enriched uranium to come out of this factory, and plus or minus 10 or 20 percent. There are enough weapons so it does not matter. You can then verify the output.

Then the material can be safeguarded as agreed between the two countries. Either you can have separate storage. You surely will have some separate storage, that is for sure. In addition, you might have some arrangement whereby some of the material, including perhaps the material from the republics if it comes to that, safeguarded under some international auspices. In other words, some of the material could then be kept by the United States and by Russia, and some under some international arrangement.

The material does not have in it any information and it is the key to reconstitution. It is what we want to keep track of.

Mr. SPRATT. One of your colleagues, perhaps your predecessor or successor—I do not know where Johnny Foster came in line of succession to you at Livermore—but he emphasized to us that we should have a very reliable method of counting, first of all, the existing end units, the completed and usable military nuclear systems. Then, second, the components that come out of them, so we have got an extremely good inventory, especially if we are looking toward a world where we get to fewer and fewer warheads, perhaps as low as a thousand to 2,000, as the NAS study recommends.

The reason being, of course, breakout, concealment, the possibility that one side might be cheating, holding some in reserve so that if there were a political reversal they might suddenly surge ahead with a cache of nuclear materials or nuclear components that would give them an advantage.

Part of this would involve going back to the fundamentals and establishing a database on each side of fissile materials, tritium and production sources. I think the Russians probably know a great deal more than we do about our production sources. I think they can obtain it simply by checking with the Public Information Office at the Department of Energy.

On the other hand, I have seen the intelligence reports. I think there is a lot that we do not know and that we think we know by inference based on what their production sources are, on their quantities of HEU plutonium and tritium that have accumulated over the years and that are either stockpiled in weapons or stored and unutilized as yet.

Do either of you see any advantage to increasing transparency here—to establishing a method for a databank of fissile materials on both side?

Mr. MAY. Well, I think that it would be good to do what Johnny Foster suggests. However, I think we do not want to give up one good in order to get another good.

There are two problems here. One, the United States and Russia is the problem of diminishing the threat in such a way that we are confident that they are not hiding anything, and we are going down more or less in phase. That problem can be solved with a fairly rough count of what is going on. Ten percent is plenty, plus or minus 10 percent. Plus or minus 20 percent is acceptable. Nothing hinges on those percentages and that would serve the purpose of the bilateral security. That is a first purpose which I would not give up while waiting for something better.

The other purpose has to do with proliferation outside Russia and outside the United States. That is a much more difficult problem. There are thousands of kilograms of material floating around the world, some of which is not under either country's control. I think to attack that problem we want to take a look at the overall world situation with respect to these materials and try to see what makes sense in the way of tighter accounting overall, taking into account Russian source, but also the other sources. I do not think the homework has all been done on that yet. It needs to be done. You need a plan, in other words.

But the point I would try to make in this testimony is that we do have two goals. One is a reduction goal for security reasons, which is very important by itself and I would not give up on that just to get the other. The other is important also.

Mr. SPRATT. Mr. Dornan.

Mr. DORNAN. Mr. Chairman, I do not want to break the flow of your questioning, but the Republicans on the Armed Services Committee are caucusing upstairs and it is a command performance.

Mr. SPRATT. I beg your pardon. I overlooked you a minute ago, so go ahead. You have the floor.

Mr. DORNAN. No, you did not. I had to run upstairs and that is why you did not see me. I was not here.

I just want to ask about the B–2—a couple of follow-up questions. But first, I want to tell both the gentlemen that their testimony is some of the best I have heard in this hearing room on a very, very fast historical track.

Could I ask you a personal question, Mr. Reed? Do you not have a Navy ship of the line, a warship named after you?

Mr. REED. No, sir, I do not. I have the honor of having a former speaker of this august body share the same name, but for better or for worse he is——

Mr. DORNAN. That is what it is. I saw a frigate, the Tom Reed, and I thought, can this be, because the other two exceptions we made, they were almost in their walkers, and you are looking pretty healthy today.

Mr. REED. I feel terrific, and it is not named after me. It was Thomas Reed, the Speaker of the House.

Mr. DORNAN. I thought, boy, the Navy must have wanted something out of the Air Force, I thought, to do that to a former secretary.

I would like your permission to steal this. I do not want to be Neil Kinnocked, so I am asking for permission because sooner or later I am going to start. I am going to not attribute it to you, but your page on uncertainty, and I know you probably did not work on it too long but the examples you picked out are about as stunning as any you could get. But I bet you could have turned each one into a paragraph of a hundred items during each decade that would have been treated dismissively as absurd science fiction, and your closing line is life does not work that way, to think there is a straight line from here to some utopia that involves 15 very happy former Soviets, so-called republics, throw in Mongolia, which was always number 16, not to mention all the East European states, and nobody can predict what type of chaos is going to take place.

So here is my question to you. It is specifically on the B–2. I was just out at one of the four B–1 bases, McConnell, last weekend. They started training conventionally at Ellsworth in September, McConnell started in December. When they are all through, trained up conventionally, this B–1, much maligned weapon system, is going to be so far superior to the former queen of the skies, the B–52, that they are just in a different area of comparison.

But to go to the B–2. Would you say, following up on your remarks that the payload is very large and that it allows one aircraft to accomplish an entire contingency mission and you mentioned the important factors involving Stealth in the Desert Storm. Would you say that the B–2 is unique and so is SDI, for that matter, because they are not only a nuclear deterrence but also involve a conventional deterrence out of all the systems we have discussed here today?

Mr. REED. That is an enormous list, Mr. Dornan. I will try to deal with it. First of all, let me back up to your kind references to my last two pages of my statements.

I am very honored that you said those things because I spent a long time thinking about those two pages. What are the threats as a result of a year of arguing about this subject. The conclusion, that we never know what is going to happen really dawned on me as I tried to think through the scenarios. Life is such that you do not know. Therefore, your responsibility in the House and in the

Senate is to try to posture the country to deal with whatever can happen.

As far as the aircraft are concerned, I think the B–1 and B–2 are very different aircraft. The important thing about the B–2 is that I think we have gotten it right in terms of the sort of weapon system that will be needed in these Third World contingencies. It may not be a nuclear mission; you do not know.

One of the things I learned in my close up exposure to the procurement of aircraft is you want to buy aircraft that are sturdy, that have a lot of payload and that are very flexible because they will be used for missions that you do not even think of on your watch. This was certainly true of the B–52. It will be true of the B–1.

I think the in the case of the B–2 it is terribly important to be able to take a very large payload some place where we are not welcome in one sortie and deal with that Third World threat, which may or may not be a nuclear problem.

I think that they are important aircraft. The B–1 is going to be a very important conventional, as well as nuclear, aircraft. The B–2 is different; but I just think we need to buy some.

Mr. DORNAN. Well, I had a second question, Mr. Secretary, but you answered it in your remarks about flexibility.

So, the only other thing I have is for Dr. May. There is some discussion now about severely phasing back Lawrence Livermore Labs. Since you gave a big chunk of your professional career to that unique facility that helped win the cold war, what would you like to see—again understanding the dangers of using a crystal ball—Lawrence Livermore Lab doing throughout the rest of this decade?

Mr. MAY. Well, it is a subject to which I give a lot of thought. Actually, I am advising the director, along with some other gentlemen, as to what should be done next.

The lab at present is about a billion dollar a year enterprise, of which 30 percent is nuclear weapons R&D, $300 million, and the rest is other R&D. I suspect the nuclear weapon R&D is going to go down a little more and that will be OK. I think in view of the program we could go down somewhat more, not a lot more. I do not want to give a figure but somewhat more in the course of time if things—if the workload goes down.

However, it cannot go down much more because we do have to help with the safety and security of the weapons and with the improvement of the complex.

I would like to see the lab continue to contribute to programs in the other defense activities, in energy and in environment which are several years further out than industry can undertake and with more uncertainty, and which are pretty large, in the few million dollars, tens of million a year. Such things as fusion energy, better coal energy, we have done work on that, and a lot of important environmental work.

I think that these are the areas where major infrastructure improvements are going to have to be made in the next few decades all over the world. I think the Lab can help the country in doing the advanced R&D work, applied R&D work in these areas where these major infrastructure commitments are going to be made all around the world. It will help the United States and it will also help in the eventual U.S. export of these technologies.

I do not think the Labs are too well suited to helping industry in detail on a month-by-month basis. They are not really organized for that. They do not have the right people, but there are plenty of long-term projects that I would like to see continue to be funded that will leave us in a healthy position with respect to energy, non-nuclear defense and environment, in addition to the nuclear project at the Lab. That would be the general answer I would give.

Mr. DORNAN. Thank you very much.

Thank you, Mr. Chairman.

Mr. SPRATT. Mr. Miller.

Mr. MILLER. Thank you, Mr. Chairman. I just have a couple of questions.

Dr. May, you talked a little bit about alert rates and I wonder if I could ask both of the witnesses to address the question of strategic force posture.

President Yeltsin has talked about no targeting, having the forces on a day-to-day basis, they were not targeted. Russian Foreign Minister Kozyrev has talked about the possibility of taking all missiles, along with the bombers, off alert and demitting the warheads. Obviously, there is the idea that there would be some political benefit and perhaps a reduced risk of accidental or unauthorized launch. I wondered if each of you would comment on those two ideas.

Mr. MAY. Do you want to go first?

Mr. REED. Yes, I would like to go first because I want to go back and answer the question that the Chairman asked 15 minutes ago about Johnny Foster. The question was how do you secure nuclear weapons.

I am a believer of the school that the longest journey begins with one step. So my answer to that would be, number one, count them. Before you worry about destruction, let us count the Soviet weapons, or get the Russians to count them. At least know where they are for sure.

Second, then set about to secure them, to either get them into very secure storage within the republics, or hopefully get them all into Russia. Then you can begin to worry about the disassembly of the electronics and the high explosives that make them not usable to terrorists and remove some problems with accidents. Then you get on to the disassembly of the nuclear package and finally doing the sorts of the things like disposing of the plutonium and the highly enriched uranium that Dr. May talked about.

But it is a large problem. Whenever faced with one like that I find it best to start chewing at the upper left-hand corner. It is absolutely imperative to get them inventoried, know where they are and get a serial number on all of them.

To the next subject. I certainly agree with Dr. May's observations about the problems of developing a database—how many Soviet weapons are there—that is pretty tough. What really counts is to know how many SS–18s are in silos that would threaten us in a very near-term way. Dealing with the Russian database is interesting, but if you are right within 10 or 20 percent, that is probably close enough. I think his observations on that subject were correct.

As to the matter of alert rates and Mr. Yeltsin saying things are not targeted, you have to really study what he said to figure out what he means. But I am absolutely opposed to being casual about targeting. We have a lot of weapons because the Soviets left behind a lot of weapons that threaten us. We know where they are, we know where the submarine bases are and we should not be casual. Getting casual about nuclear weapons really worries me a lot.

If you want to talk about flexibility, then you set aside 10 weapons in some sort of special pocket that maybe are dealt with in real time when there is a crisis. But we should not, for one moment, get casual about large numbers of weapons.

Alert rates: I think you want to do what you can to stand down the hair trigger. This has been done by pulling bombers off alert. If you talk about pulling missiles off alert, you start getting into some real-world problems of what does that mean. If you are going to take the warheads off the missiles, where are you going to put them?

It turns out that being in a silo under pretty careful watch is a pretty secure place for them. There are limits as to how many warheads you can store at Ellsworth Air Force Base. There are limits as to where you're going to put all these things. There are limits on moving them around the highways. So all I could advise is that it is very complicated. It is a very desirable thing, but you have really got to think through all the issues.

Mr. MAY. I would agree with that. I am not an expert on the details of how you de-alert forces. You heard from General Butler, who is the right man on the subject. I think basically, given the policy directive that we want the forces to be as safe as possible and yet invulnerable, there is going to be a plan that will be evolved, or a set of plans that will be evolved with full knowledge of the detailed situation by the strategic command. I would want to look at that plan and see what it is.

It is not a simple matter. As Mr. Reed said, it is not something to be casual about.

If you want to talk about historic trends, the historic trend, I think, if relations continue to get less tense, it is going to be that you are going to have nuclear weapon as a reserve component of force with a multitude of missions assigned to them but no single one per weapon; but we are not there yet. There are still forces on alert on the other side.

But the trend is right, we should get forces down from alert so long as it is consistent with survivability. How you do it in detail is pretty complicated. I could not address that.

Mr. MILLER. Thank you.

Let me ask a question on a different subject, and that is with respect to the role of nuclear weapons and the Third World.

What role, if any, do you believe that U.S. nuclear weapons played in deterring Saddam Hussein from the use of either chemical or biological weapons during the Gulf War?

Mr. MAY. Obviously, I have no way of knowing. They may well have played some role. The chemical weapons are very different in kind from nuclear weapons. They are not decisive like nuclear weapons. They have not been used successfully in warfare. They are terror weapons mostly against civilian population. They are not particularly effective against a prepared military force, whereas, of course, nuclear weapons are very effective against any concentration of force.

They may have played some role. It is very hard to tell. I cannot go inside his mind.

In a more general way, I think that U.S. nuclear weapons tend to be a force for the status quo, but they are not the front line deterrent for what we call Third World states. It is hard to draw general conclusions because as you well know, Mr. Miller, there is no Third World. There are a whole bunch of very different countries, and the considerations that would affect North Korea, which is bordered by China, Russia and South Korea and, of course, Japan is a very different environment from the Mid East. They are going to be quite different from the considerations that affect Iran. Kazakhstan is part of the former Soviet Union, so probably the Russian nuclear weapons matter more to them. So it is a little hard to say.

I believe that, as I made it clear, we should keep reserve nuclear weapons, keep them in the back as a deterrent of last resort, attempt to work cooperatively to contain dangers, and I cannot give you a better general answer.

Mr. MILLER. Thank you.

Secretary Reed.

Mr. REED. I would like to answer the question a little bit broadly and discuss what was the role of nuclear weapons in general, because I think Israeli nuclear capability played a very significant role. I think Saddam's decision to not use chemical weapons is a branch point. I am very strongly of the view that Saddam Hussein clearly understood that the use of chemical weapons against Tel Aviv would have brought an immediate massive nuclear strike without a whole lot of consultation with the United States. I think that was a very substantial deterrent.

As far as the U.S.'s role, I agree with what Dr. May said, that it is very gray. There is—George Bundy has written a very scholarly paper concluding that nuclear weapons did not play a role. My feelings are that they probably did, in dissuading a lot of further irrational activity, but you will never really know.

Perhaps that gets back to the bottom line. The role of nuclear weapons, our policy should be to be ambiguous, but they are simply there as a presence.

Mr. MILLER. Thank you.

Mr. SPRATT. Mr. DeGrasse.

Mr. DEGRASSE. Mr. Reed, following up on what Mr. Miller just asked you in regard to the question of the role of nuclear weapons in deterring Third World nations.

Dr. May sort of indicated that U.S. nuclear weapons tend to emphasize the status quo situation. I am wondering about the difference between Israeli nuclear weapons used against Saddam Hussein and U.S. nuclear weapons used against Saddam Hussein. It would be fairly substantial, I would think, and the decision-making process would be very different.

Do you see cases in which a status quo use of nuclear weapons is likely, or status quo decision-making process, making the decision as to the use of nuclear weapons would actually successfully deter Third World nations?

Mr. REED. Well, I think the examples you use is that nuclear weapons—the status quo—are important in preserving the national security and survival of a nation. The U.S.' survival probably would not be impacted by a chemical attack on Riyadh.

Mr. DEGRASSE. Right.

Mr. REED. Israel's survival would most certainly be involved with a chemical attack on Tel Aviv and therefore their standards are different. I think that the fundamental underlying issue is nuclear weapons are the sort of thing you think about when a nation's survival is at stake.

Mr. DEGRASSE. Let me follow up on the question of counting nuclear weapons, can either of you gentlemen discuss the question of whether or not we would compromise U.S. security by making such an exercise, counting U.S. and Soviet weapons a reciprocal effort on both sides?

Mr. MAY. In my opinion, no. In my opinion, we will have to make it reciprocal if it is going to happen. I do not want to quote any individual sources in Russia, but certainly the gist of the feeling I got from talking to quite senior people over there in the military and defense areas is that they intend to have everything reciprocal, just like it has always been. The fact that they are an economic basket case does not cut any ice so far as these things are concerned in their minds.

So, I think we will have to count if they are going to count. I think the benefits of counting vastly overweigh the cost of giving away a count. I mean, we are going down from numbers in excess of 20,000 to numbers vastly below that by anybody's count. So I think it is fine. Count the number destroyed, that is fine. You do not have to give an accurate count on the rest if you do not have an agreement to.

Mr. REED. I think any sort of mutual counting is in our best interests; that generally the United States is an open society. The Soviet society was not. The Russian society is becoming that way, but I do not think anything that is reciprocal like that would not be in our best interest. I think we should.

Mr. DEGRASSE. One final question. This one to Dr. May and then sort of following upon Mr. Kyl's question to you regarding SDI.

If you look at the ground base defenses that are being considered, the prospect of siting 100 interceptors at Grand Forks in North Dakota, is that what you were thinking of in terms of your response to his question? If it is, is it that you do not see an immediate threat that could be used or could be countered. Or is it your view that the technical capabilities of such a system are deficient?

Mr. MAY. Both. In my own judgment—and notice I say judgment—there is no way you can tell for sure. If you look at both the threat and the cost effectiveness, in my judgment, I find that the system is not ready to be deployed bearing in mind the fact that there is not all the money in the world for defense these days. So if we spent two or three billion on this, you can't spend two or three billion elsewhere.

On the threat side of it, the threats that I have been mentioning have been Third World and accidents. Accidents are extremely difficult to defend against because you have absolutely no strategic warning. So you are talking about a system which has to be up, ready to go all the time, and ready to go against an accident or a malfunction of which you will have no warning, no strategic warning.

If you look at that kind of system, you are stuck with very high false alarm rates or else a very high probability of an initial failure. So that does not seem to me like the right way to meet the kind of accidents that might occur.

Bringing weapon systems off alert is going to drastically reduce the probability of accidents which has already been—knock on wood—very low.

If you talk about threats like, for instance, from some future Iraq against U.S. targets, strategic threats against some U.S. city, I think that someone like Saddam Hussein would have to be insane to first go ahead and build some ICBM installation which we and all the rest of the world could see out there in the desert, very hard to hide, that could reach the United States, 6,000 or 8,000 miles away, and then start a war with us or one of our allies. If he is going to threaten Washington or New York, there are a hundred ways to deliver the weapons. There is no rush. Washington and New York are going to be there. You can buy a boat, buy a civilian plane. You do not even have to get them in the country, as you well know.

So for a strategic retaliation of a small power, strategic deterrence of a small power against U.S. cities, I do not think that the ballistic missile defense would give us much comfort.

For countering tactical situations, that is an entirely different ball of wax. I think that the Third World country, or I do not like that expression, some country like Iraq or some future country who wants us out of their area may well have nuclear weapons and pose a threat against, for instance, elements of the U.S. Navy or air bases, and those would be very effective threats which might or might not be counterable by tactical ballistic missile defenses. You have to look at that.

But my overall judgment on the strategic system is that the threat is not really convincing to me and the effectiveness is not going to be there, I think, but you have to keep looking.

Mr. DEGRASSE. Dr. Reed, did you have a comment on that?

Mr. REED. I think a lot of that makes sense, but my view of the threat is the Third World threat, not just against Washington and New York. I agree there are lots of ways to do that, but that it also takes a long time and there are lots of chances of discovery, but the more immediate issue would be to look back to the Iraq-Kuwait episode. If Saddam had nuclear capability on the Scuds or slightly larger theater ballistic missiles and was able to threaten Paris, London and so forth, would we have been able to put together a coalition? I do not think so. Therefore, a defense system really ought to be deployed in conjunction with the Russians and deal with the whole spectrum of threats around the globe, which is why I like a space-deployed system.

Mr. DEGRASSE. Thank you both.

Mr. SPRATT. Dr. May, Mr. Reed, thank you very much for your testimony and for taking the time to come in and present it today. We appreciate your presence.

Mr. MAY. Thank you, Mr. Chairman.

Mr. REED. Thank you.

[Whereupon, at 3:40 p.m., the subcommittee was adjourned.]

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